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PROFE

NOTES

—ON—

MILITARY ADMINISTRATION

For the Use of the Cadets

—OF THE—

Royal Military College of Canada.

COMPILED BY

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INTRODUCTORY.

Military Administration deals with the general principles of raising, maintaining, moving, organizing and governing armies, the natural composition and functions of the military machinery, and the duties of staff officers in peace or war.

As there are many years of peace to one of war the duties during war must be mastered and perfected in time of peace.

The different departments of an army are sometimes, especially in newly created and defectively organized forces, found to work mostly for their own welfare regardless of the common weal and often in antagonism to other branches. To prevent this jarring and friction, all officers should be acquainted with the functions and powers of all the different departments, and this knowledge is best obtained by practice after mastering theory.

The English system of selecting officers for the staff is therefore good. They remain on the staff a certain definite period, or as long as their services are required, and then return to their regiments. Staff officers coming in contact with the different branches of the service and with the various departments have opportunities of learning the duties and requirements of each, which officers doing merely regimental duty are debarred from, and consequently, when the former return to their regiments, the knowledge obtained when on the staff proves of great advantage. Again, to command all arms, whether on service or not, requires a proper acquaintance with each, and when an officer who has only done regimental duty becomes a general, he finds himself in a difficult position, which a little staff experience would have obviated.

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CHAPTER I.

ORGANIZATION.

The difference between an army and a mob is discipline, and discipline alone confers on bodies of men the power of manœuvring. Drill is a means to discipline, but drill is not discipline, which may be defined as un murmuring obedience to the orders of superiors, in spirit and in letter. This alone can give reliance of all ranks one with another, and confidence in unity of effort towards the attainment of one common object.

Soldiers differ from civilians in being subject to a special law which applies to them alone, and in being under special obligations. For instance, disobedience of the orders of a superior is, in the case of a soldier, an offence against the law and punishable accordingly. These special laws and regulations are necessary for the enforcement of discipline without which an armed body of men is a danger to itself and to society at large. The laws which specially apply to British soldiers, were until 1879 the Mutiny Act passed annually by Parliament and the Articles of War, now the Army Discipline and Regulation Act, which is only brought into force by an annual act of Parliament.

By this Act the Sovereign is empowered to make Articles of War for the government of the army, but none are at present in existence. This Act enumerates the military offences, defines the modes of dealing with offenders, lays down a scale of punishments, empowers Her Majesty to frame rules of procedure for courts martial, courts of enquiry, etc., etc.

This "Military Law" has to be judicially recognized by all civil courts, but it is not allowed to delay, obstruct or override civil law, until the latter is declared by authority to be replaced by martial law. Offences against the civil law committed by soldiers are generally tried by military law; but there are some offences as treason, murder, manslaughter, treason-felony or rape, which, when committed in Her Majesty's dominions, cannot be tried by military law except on active service, or unless there is no competent civil court within one hundred miles as measured in a straight line.

There are also published for the government of the army: 1st, monthly *Army Circulars*, which must be looked upon as a supplement to a book called the "Revised Army Regulations," in which they become incorporated in the new editions. 2d, monthly *General Orders*, which are supplementary to another book called the "Queen's Regulations and Orders for the Army," and become incorporated in the new editions.

Army Circulars are issued monthly except on special occasions when their matter is urgent, and then they are embodied in those of the next month. They are issued under the direct authority of the Secretary of State for War, signed by the under Secretary of State. They contain all Royal Warrants and Regulations framed thereon by the Secretary of State for War, which govern the system of appointments, promotions, exchanges, retirements, rank, relative rank, pay and emoluments, as well as matters connected with the organization of departments and their changes. They also regulate from time to time, generally once a year, the establishment for each unit of the army; and they deal in detail with allowances and issues of all kinds of food, forage, fuel, light, arms, ammunition and warlike stores, whether for barracks, hospitals, field or personal equipment. In fact, all expenditure of money or "materiel" is regulated by the *Army Circulars*. All circulars relating to the reserve and auxiliary forces are now embodied in the monthly *Army Circulars*.

The "Lists of Changes in War Materiel and of Patterns of Military Stores, which have been approved and sealed, with instructions relating thereto," are also issued with *Army Circulars* though detached from them. These lists give descriptions, frequently illustrated by diagrams, of all ordnance, arms, ammunition, military carriages, torpedo stores, equipment, etc.

General Orders are also issued monthly and specially. They contain the orders of the Commander-in-Chief acting under the Secretary of State for War, under his authority direct or implied. They deal with the details of raising, organizing, training, governing and educating troops; also with the details connected with appointments, promotions, exchanges, retirements, and with the details (not involving expenditure or issue), of arms, ammunition, clothing and equipment. They regulate details connected with movements of troops by land and sea, manœuvres, conditions under which medals, honorary rewards and honorary distinctions are granted, excluding money awards. They are signed by the Adjutant General of the Army.

Besides these, there are, of course, orders issued by general officers in command of Districts, called District or Garrison Orders, also Regimental or Detachment Orders, and Troop, Battery or Company Orders.

An army in time of peace should be so organized that when necessity arises, it may, in a short time, be placed on a war footing or be "mobilized." It is perfectly clear that to establish and maintain discipline there must be *personal contact* between the superior and the inferior, and as one man can influence only a limited number of his fellow-men, it follows that the size of the first body or "unit" into which a mass of men is divided, must bear some relation to the number of inferiors that can be influenced by one superior. Upon this basis must ultimately rest the division of armed bodies of men into companies, battalions, regiments, brigades, divisions, army-corps, armies.

But not only must soldiers be disciplined and commanded, they must also be paid, fed, armed and clothed. Hence the division of men into organized bodies should be such as will facilitate "administration." Two distinct objects have therefore to be taken into account: 1st, Tactical efficiency, 2d, Facility of administration; but the latter must conform to the former. The organization of armies consists in their sub-division into such fractions as can be efficiently controlled by one man, and again grouped into higher units,—the object to be attained being to gain the greatest mobility, easiest supervision and control, and unity of command. If the fractions are too large, there is a want of mobility and difficulty of supervision; if too small, there is confusion in the multiplicity of parts, and waste of power in having so many superiors.

It is found that one man can control from four to eight men efficiently. Take for instance the German company; the captain controls his four lieutenants, the ensign and the company sergeant major; and these in turn control forty-two other N. C. officers, who control 209 soldiers. In the British service, in a battalion, a lieutenant-colonel has the assistance of one or two majors, one adjutant and one sergeant-major, with eight companies.

From three to six corps d'armée are considered sufficient for one commander; if there are more the force is divided into two or more armies.

It has already been observed that discipline can be best maintained by personal contact of a superior with inferiors, and as the provision of food, arms and clothing for men, keeps the superior in contact with the inferior, and induces the latter to lean on, be governed and guided by the former, it follows that, if possible, the first tactical division should correspond with the first administrative division, or, in other words, that the smallest independent tactical command (the company in the infantry), should also be the smallest administrative division. This is in effect the case, as the captain of a company commands, drills, pays and looks after the men of his company. The size of the company, however, varies much in different armies. In the English army a company on a war footing varies from 100 to 120 men, the captain being on foot. In Germany a company is 250 strong and the captain is mounted.

In the British cavalry a troop of about 60 troopers is the administrative unit under a captain, but a squadron, formed by the union of two troops under the senior captain, is the tactical unit. Four squadrons form a regiment.*

In the artillery the battery of six guns is the tactical and administrative unit under a major. A brigade of artillery consists of two or more batteries; when there are more than two batteries, the brigade is divided into brigade divisions of two batteries each.

In the Engineers the company is the unit under a captain.

Two or more battalions or regiments united compose a brigade. In England three battalions form an infantry brigade, and three regiments of cavalry form a cavalry brigade. Two or three cavalry brigades are sometimes united to form a cavalry division.

A Division of Infantry is the first body that is composed of all branches of the service, hence it comes more nearly to the definition of a tactical unit of an army than any other body, and the division being composed of all arms is thus at the base of all army formations.

The English division is composed of two brigades of infantry and one rifle battalion (seven battalions), one regiment of cavalry, three batteries field artillery, (1-9 Pr., 2-16 Pr.), one company engineers, etc., etc.

Three divisions go to form an army corps with the addition of: One brigade of cavalry, three batteries horse artillery, two batteries field artillery (16 Pr.), one company engineers, etc., etc. Several army corps form an army.

In organizing an army it is advisable to number divisions one, two, three, etc., right through the army; thus the 2d army corps of an army would contain the fourth, fifth and sixth divisions. The brigades of cavalry should be similarly numbered. The brigades of infantry should be called right and left brigades of such and such a division.

CAVALRY.—The proportion of cavalry in a British army corps, is one sixth of the infantry, but taking each battalion at 1000 bayonets, and each cavalry regiment at 500 sabres, the proportion would be one-seventh of cavalry. The nature of the service on which an army is sent, and the character of the country to be operated in must always greatly influence this proportion. In countries where forage is plentiful, especially in open countries, cavalry is most useful. A brigade of cavalry armed with good carbines might go anywhere, even in the closest country, by dismounting two-thirds of their numbers. They are invaluable for making rapid movements on an enemy's flanks, rear, etc., or in pursuit.

ARTILLERY.—The proportion of guns to sabres and bayonets in an army corps is, as nearly as possible, three guns to every 1000 men. At 1000 men per battalion, and 500 sabres per cavalry regiment, the proportion would be 3.75. This proportion must always depend upon the nature of the service which the army is to be employed upon, the topography of the theatre of war and the quality of the troops; the better they are, the smaller the number of guns required. An army occupying defensive positions requires more guns than does one engaged in offensive operations in the field.

ENGINEERS.—The proportion of engineers to sabres and bayonets has usually been counted as one to thirty. This proportion was laid down before the duties in connection with the maintenance of railways, the working of telegraphs, torpedoes, etc., were included in engineer duties. In the Franco-German war the engineers were about one to twenty-eight.

The following tables give the complete war strengths of brigades, divisions, and army corps:

BRIGADE OF CAVALRY AND INFANTRY (Without Tents.)

COMPOSITION.	OFFICERS AND MEN.		HORSES.			Guns.	CARRIAGES.			
	Officers.	Total All Ranks.	Officers.	Troop and Draught.	Total All Kinds.		Carts or Light Wagons.	Wagons.	Forges and Spare Gun Carriages.	Total All Kinds.
BRIGADE OF CAVALRY.										
Staff	3	11	11	....	11	..	..	..	..	..
3 Regiments	93	1959	273	1572	1845	..	3	24	3	30
1 Battery Horse Artillery....	7	181	15	168	183	6	..	9	1	10
Veterinary Department	1	3	2	....	2	..	..	..	..	..
Chaplain's Department	1	2	1	....	1	..	..	..	..	..
Commissariat and Transport	3	87	3	127	130	..	2	16	1	19
Medical Department*	5	75	5	....	5	..	2	17	..	19
Postal Department	..	2	....	....	..	..	..	..	..	..
Total	113	2320	310	1867	2177	6	7	66	5	78
BRIGADE OF INFANTRY.										
Staff	3	11	11	....	11	..	..	..	..	..
3 Battalions	93	3291	33	135	168	..	12	24	..	36
Veterinary Department	1	3	2	....	2	..	..	..	..	..
Chaplain's Department	1	2	1	....	1	..	..	..	..	..
Commissariat and Transport	2	45	2	47	49	..	2	8	1	11
Total	100	3352	49	182	231	..	14	32	1	47

*Includes half a Bearer Company, which receives horses and drivers from the Commissariat and Transport Department.

NOTE.—An Infantry Brigade depends on the divisional organization for its Medical and Postal Service.

A DIVISION (Without Tents.)

COMPOSITION.	OFFICERS AND MEN.		HORSES.			CARRIAGES.				
	Officers.	Total All Ranks.	Officers.	Troop and Draught.	Total All Kinds.	Guns.	Carts or Light Wagons.	Wagons.	Forges and Spare Gun Carriages.	Total All Kinds.
General Staff of Division	15	53	39	....	39	..	....	..	....	....
2 Brigades Infantry	200	6704	98	364	462	..	28	64	2	94
1 Battalion Infantry	31	1097	11	45	56	..	4	8	....	12
1 Regiment Cavalry	31	653	91	524	615	..	1	8	1	10
Field Batteries 1 9-pr. }	7	174	8	124	132	6	....	9	1	10
" " 2 16-prs. .. }	14	400	16	310	326	12	....	18	2	20
1 Infy. and Arty. Ammn. Res.	6	214	7	250	257	..	22	26	3	51
1 Field Company Engineers..	6	202	11	35	46	..	....	6	....	6
1 Troop Military Police.....	2	75	2	63	65	..	....	....	....	....
Veterinary Department.....	1	9	2	....	2	..	....	....	....	....
Chaplains Department	1	2	1	....	1	..	....	....	....	....
Commissariat and Transport..	11	250	11	329	340	..	1	50	2	53
Medical Department 1st Line.	14	206	14	89	103	..	5	35	....	40
" " *2nd Line.	16	106	16	....	16	..	4	20	....	24
Postal Department.....	..	3	..	....	..	..	....	....	....	....
Total	355	10154	327	2123	2450	18	65	244	11	320

*The first line of the Medical Department includes Bearer Company.

The second line consists of two Field Hospitals, for which horses and drivers are furnished by the divisional Commissariat and Transport Department.

AN ARMY CORPS (Without Tents.)

COMPOSITION.		OFFICERS AND MEN.		HORSES.			CARRIAGES.				
		Officers.	Total All Ranks.	Officers	Troop and Draught.	Total All Kinds.	Guns.	Carts or Light Wagons.	Wagons.	Forges and Spare Gun Carriages.	Total All Kinds.
General Staff of Corps ..		24	96	80	....	80	..	....	....	....	....
Three Divisions		1064	30459	980	6367	7348	54	195	732	33	960
One Brigade of Cavalry ..		113	2320	310	1867	2177	6	7	66	5	78
Corps Engineers, Artillery	{ Regimental Staff*	6	21	16	....	16	..	....	....	....	....
	{ 3 Horse Arty. Batts.	21	543	45	504	549	18	....	27	3	30
	{ 216-pr. Field Batts.	14	400	16	300	316	12	....	18	2	20
	{ Ammunition Reserve..	18	513	21	492	513	..	6	84	9	99
	{ Regimental Staff*	2	7	5	....	5	..	....	....	....	....
Corps Telegraph Troop	{ 1 Fd. Co. & Fd. Park	7	236	13	82	95	..	....	15	....	15
	{ 1 Pontoon Troop..	9	339	17	226	243	..	....	30	1	31
	{ 3 Telegraph Troop	7	179	13	96	109	..	....	12	1	13
1 Troop Military Police..		2	75	2	63	65	..	....	....	....	....
Veterinary Department..		1	13	2	....	2	..	....	....	....	....
Chaplain's Department ..		1	2	1	....	1	..	....	....	....	....
Commissariat & Transport	{ Depl. Staff Hd. Qrs. *	2	7	3	....	3	..	....	....	....	....
	{ Transport	20	770	21	1188	1209	..	9	166	4	179
	{ Supply	7	59	7	....	7	..	....	....	....	....
Ordnance Store Dept. *†	{ Bakery Train	3	195	3	....	3	..	5	17	1	23
	{ 2nd " 6 Fd. Hospitals†	28	296	40	....	40	..	....	27	3	30
Medl. Dept.	{ Depl. Staff	8	23	11	....	11	..	....	....	....	....
	{ 1st Line Bearer Comy.	6	78	6	....	6	..	3	18	..	21
Postal Department.....		48	318	48	....	48	..	13	60	1	74
Total		1414	36993	1663	11186	12849	90	238	1272	63	1573

*In addition to those included in the General Staff of the Army Corps.

†Furnished with Horses and Drivers from the Commissariat and Transport Department; those for the Field Hospitals being estimated for moving 3 Hospitals at one time.

CHAPTER II.

RECRUITING.

Recruiting is of the first importance for it includes the whole means by which men are obtained to serve as soldiers, the numbers required, the period of training and future liability to military service.

The military policy of a country is a matter which concerns the statesman, not the professional soldier. Also the mode of supplying the ranks with recruits, the numbers required, etc., are matters of general not professional policy, and are dictated by national desires.

The laws of recruiting in each country are therefore passed by the legislative assemblies. These laws state fully the means by which men are to be raised, trained and kept ready for war.

In olden times the whole male population had to bear arms, in more recent years only a fraction of the population, and now in these days of colossal armies it is necessary on the European continent to train to arms the whole male population. Nearly the whole male population may be employed in war, but war must then of necessity be of brief duration, as social economy exercises a wholesome check on the military element, for during war there must be a complete cessation of all civil labour, which, if continued long, must exhaust the country. Modern struggles will then be brief but severer, and the time for preparation, after war is declared, will be very short and reckoned by days instead of by months, as heretofore, and the nation which is first ready for war has a great advantage over another not so prepared. It is, therefore, far more necessary, than in any previous era, to maintain the military machinery in perfect working order, and to so organize it that it may be placed on a war footing in a very short time. Preparedness for war depends not only on internal military systems, but also on vigilant attention paid during peace time. All recent improvements in the organization of great European powers has aimed at mobilizing reserves as speedily as possible.

It will be seen then that the military policy of a country must chiefly depend on its geographical position, its financial circumstances, and also on political causes; some nations requiring larger numbers than others, and some, also, as has been pointed out, requiring their armies to be ready to take the field at a moment's notice.

To consider first the geographical causes which govern the question of numbers: Countries of which the boundaries are slightly marked and easily crossed are naturally open to sudden invasions, and the power of invasion is limited by the number that can cross the boundary in a given time. For instance, all the nations on the European continent are subject to this in more or less degree, and are constantly required to be ready for war. So on this continent Canada is open to the United States and *vice versa*. On the other hand, a country like England, of which the principal defence is the surrounding sea, can not only manage with a smaller army, but will have more time to get ready.

Political considerations involve questions of public feeling and expediency as well as the chances of being mixed up in the quarrels of other powers, to which nations more remote are less liable than those close at hand. The neighbouring powers on the European continent consider, therefore, that their security consists, first of all, in having large armies constantly ready to take the field so as to be able, by invading the enemy's country, to remove the theatre of operations to that country; while England, looking mainly to the safety of the country and her colonies, and trusting a good deal to the co-operation of the navy, is content to rely on small numbers.

The military requirements of different nations are best shown by the proportion of soldiers they maintain to the number of inhabitants.

Great Britain has for home defence only, including militia and volunteers, but excluding garrisons in India and her colonies, about 1.25 per cent of the population; but for offensive purposes, i. e., regular troops capable of taking part in a foreign expedition, only .25 per cent.

France maintains, if she mobilized all her forces, about 2.5 per cent; and the portion available for offensive purposes, is 1.46 per cent of the population.

Germany, including Landwehr, but not the Landsturm, has 3.07 per cent, and for offensive purposes 1.73.

Russia, including militia, 1.53, and for offensive purposes 0.82 per cent; but she has recently increased her army.

Austro-Hungary 3 per cent, and for offensive purposes, 1.94 per cent. Her failure in 1859 was due not so much to military causes as to her financial exhaustion.

The present military policy of England appears to be to maintain a supremacy at sea against any possible combination; to keep enough men under arms in the United Kingdom for home defence, also to have enough to furnish an auxiliary expedition abroad, to fulfil, if necessary, her various guarantees, to hold India, to protect her other colonial possessions from hostile aggression, and to stand aloof as long as possible from the international quarrels of other nations as long as her national interests are not affected. No data can be formed as to her real requirements, but her peace establishments amount to about 100,000 men in the United Kingdom, in her colonial possessions to about 20,000 men, and in India, exclusive of native troops (123,000), to about 63,000 men, supplied and sustained from England.

Compulsory Service and Voluntary Service.

If it be agreed that as many men as possible are to have a certain amount of military training, compulsory service is the only resource, and this, it will be found, is the plan universally adopted by the principal foreign powers. On the other hand, for smaller numbers, compulsion may or may not be necessary.

The primary reason given for universal military service is that to ensure peace, as many men as possible must be trained for war, not necessarily for purposes of aggression, but mainly for the defence of the country. Everyone, therefore, is compelled to take his share of the burden, and is required to pass some years of his life in one or other branch of the service. Released from the army, he is enrolled in reserves, and still held liable to be recalled to the colours in case of war. This practically continues as long as he is likely to be useful, since few, if any, are free till nearly fifty years of age.

The means by which compulsory enrollment is carried out are generally the same in each country. The names of the whole male population are registered, and as soon as men arrive at twenty or twenty-one years of age, liability to military service commences. Thus every year the number that can be enrolled is known. Some are taken for the active army, some are kept in reserve; but all are generally liable to have to undergo their military training at once.

In favour of the compulsory system it is urged that:

1st, Every citizen enjoying the protection of his native country, owes in return military service for the defence of his country, and to render this service efficiently he must be trained in the army.

2nd, No other system can produce a large and unfailing supply of men.

3rd, It offers facility and certainty in calculating resources.

4th, It affords means of organization, wholly unattainable by the voluntary system.

5th, There need be no hesitation in adopting whatever regulations may be best for the service without fear of diminishing the supply of recruits.

6th, Its influence is beneficial as a means of educating the masses.

7th, A better class of men are drawn into the service and the standard of the service is raised in consequence.

8th, It is economical.

The arguments against the compulsory system are :

1st, Whenever a nation requires only a portion of its men for military service, the burdens fall unequally on those who are drawn by lot, as they cannot follow the occupation they otherwise would. By the voluntary system the soldier is paid a fair wage as a labourer and the burden of defence falls equally on all.

2nd, When substitutes are allowed, the consequences of being drawn are more serious to the poor man who cannot pay for a substitute, than to the rich. Where substitutes are not allowed, then the misfortune of being drawn is greater for the educated man who is trained for a higher pursuit.

3rd, It is injurious to commerce.

4th, It encourages (or necessitates) emigration. This is either good or bad, according to whether the country is over-populated or not.

It cannot be denied that the advantages of the compulsory system are all important, but the disadvantages are great. The burdens are oppressive, grievous and unequal, and have been so terribly experienced where the system has existed for some time, that most nations using it have to make some concessions to mitigate the hardships and make it less oppressive.

As applied to the regular forces the economy claimed for the compulsory system is doubtful. The pay of the soldier bears so small a ratio to his actual cost of clothing, feeding, etc., that the economy of this system is really small as far as the army is concerned. As concerns the reserves, the economy of this system is apparent, as they cost nothing except their clothing and arms. Socially, this system, by compelling men of superior attainments and qualifications to apply them to an order of work inferior to that for which they are qualified, retards the industry and therefore the prosperity of the country. Men are forbidden to emigrate until their service expires.

Compulsory service, then, is an element of military strength yielding efficient organization and national safety, but is only resorted to when it is compulsory on the nations themselves, and never from choice.

In order to make the burdens of compulsory service press less heavily on the population, conscription in the different countries is, or has been, modified in some of the following ways :

1st, By allowing special exemptions.

2nd, By voluntary service.

3rd, By paid substitutes.

4th, By ballot.

5th, By short service.

6th, By increased pay for continued service.

7th, By provision for after years at the end of long service.

These require only a short explanation :

1st, Special exemptions are now generally permitted in the cases of only sons, orphans, eldest of two brothers chosen, students of theology, professors, etc. Some of these are, however, enrolled in the reserves.

2nd, Voluntary service consists in serving for a short period (generally one year), and bearing the whole expense, arms only being provided by the public. This is permitted to students of learned professions, educated people, etc., provided they are physically fit.

3rd. Paid substitutes were, formerly, sanctioned in the French army. At first, substitutes were provided by private arrangement ; latterly the government took the matter into their own hands, the cost of a substitute in 1870 being about 92*l*. Since the new law of recruiting has been introduced (1873) this plan has been entirely abolished.

4th, Out of the number of men of the prescribed age in any year those required for service in the army are selected by ballot. Men who draw the lucky numbers are excused service with the colors, but have to be enrolled in the reserves.

5th, Granted the necessity for compulsory service, it follows that the hardships of that service are materially lessened by making the period of training as short as possible. Compulsory service in the ranks varies in different countries from 2 to 6 years, after which men are drafted into the reserves. for from 4 to 9 years, at the end of which time they are still liable to be called out for the defence of their country, or as last reserves. In each case the extreme amount of service in the ranks is fixed, men who are qualified before the expiration of the fixed term being usually allowed to go on furlough until required. The limit to short service in the ranks is determined by the time required to make good and efficient soldiers.

6th, Men who are promoted to be N.C.officers while serving in the ranks, and sometimes also privates who are likely to become N. C. officers, are permitted to re-engage to serve on with the colors, and receive then a higher rate of pay.

7th, Re-engaged men have a claim at the end of their services to government appointments in the post-office, police, customs, etc.

In this way many of the great disadvantages of compulsory service are met, but there still remain the objections already enumerated.

In England, in her colonies and in India, and also on the continent of America, recruits are obtained by voluntary enlistment. The advantages claimed for this system are :

1st, Men are not forced into the ranks.

2nd, It does not interfere with civil pursuits.

3rd, It is entirely in accordance with the spirit of the people.

4th, It leads to personal freedom and national prosperity.

The disadvantages are :

1st, Small numbers, there being no guarantee that sufficient men will be found for war.

2nd, Greater expense.

3rd, A class of men of relatively social inferiority in the ranks.

The voluntary system exists in England because it suits English ideas of liberty and individual freedom and is the national desire ; but this system does not extend to the militia where the ballot is in force, but even that it is considered advisable to suspend every year by an annual act of Parliament. The voluntary system exists also in Canada and in the United States, and in these countries the ranks of the militia may also be filled by ballot, showing that here also the principle is recognized that every citizen owes military service for the defence of his country.

The causes that allow or compel England to adopt the voluntary system are, the small number of men required for the regular forces owing to her geographical position, and the large proportion of these forces which are required for indian and colonial service, as expatriation for a number of years would not be submitted to, and compulsory service could in any case only be made applicable to the home army.

The voluntary system is naturally adopted when possible, but it has been found insufficient in past wars to keep up the required contingent even with high bounties. The recent statistics in England also show that the men who present themselves have to be taken without much regard as to whether they are desirable in their moral, intellectual or physical attributes. The method of obtaining recruits in England also affects the supply. The number of men voted annually by Parliament fluctuates. One year recruiting is encouraged and another year discouraged, and as this is mostly done by raising or lowering the physical standard, it happens that for consecutive years men perfectly fit for service may be rejected

and good material wasted, while at other times it may be necessary to accept men not fitted for the required work. Armies cannot be suddenly extemporized, and when a national crisis occurs in countries not maintaining a sufficient military establishment, a panic ensues with the inevitable result, that even if the nation is saved, an enormous waste of blood and treasure follows, accompanied by universal suffering.

Comparison Between Long Service and Short Service.

The evil of maintaining perpetually under arms as large a force as is required in war is its great expense, and therefore, since 1870 the system of short army and reserve service, borrowed from continental nations, has been introduced in England with a view to lessen the great objection of small numbers with the colors.

To create reserves a previous training in the regular army is indispensable for their efficiency. This is incompatible with long service, as old soldiers with 15 years' service and upwards are not worth much for campaigning; short service is, therefore, the only method of providing efficient reserves.

The choice lies then between long service in the ranks with thorough training and a small annual demand for recruits, and reserves partially trained with a large annual demand for recruits.

Long service formerly meant for 21 years or for life, now less periods would be called long. On the side of long service we have the discipline and self-reliance of old soldiers, their *esprit de corps*, and the cohesion of the whole. On the other side are the advantages of youth and activity, more necessary than ever with the present long range of projectiles and necessity for rapid concentrations, so that the qualities of the veteran are losing their importance.

Comparative abolition of pensions is another argument, a stronger army being thus maintained for the same money, and the men are not so wholly unfitted for any other pursuit, but on the contrary, after a few years, the education and discipline rather improves them.

Up to the time of the introduction of the short service system all enlistments had been for 12 years in the first instance, men being rather encouraged to re-engage to complete 21 years service. Now enlistments for all branches of the service are still for twelve years, but that period is divided between army and reserve service, proportioned to different branches, at the option of the authorities and the recruit. The shortest time to be spent in army service is three years, and re-engagement is permitted rather than encouraged. Enlistments for twelve years army service are termed "Long Service Enlistments", for any shorter periods "Short Service Enlistments."

To sum up the arguments for and against long and short service :
The advocates of long service urge that :

1st, It increases efficiency.

2nd, It gives confidence to both officers and men.

3rd, It is peculiarly applicable to voluntary enlistment, for recruits generally mean to make the service a profession.

4th, It saves expense in recruiting and training.

5th, It is the only means for providing for the colonial duty required from British troops without great expense and frequent reliefs.

Against long service, and in favour of short service, it is urged that :

1st, More men are trained by short service, and that the men are younger and therefore more active.

2nd, That desertion will be less than under long service.

3rd, All men who enlist are not fitted for the army.

4th, As it is expensive to maintain a large army during peace, self-supporting reserves must be formed.

On the introduction of short service the objection was at once raised that the large amount of colonial duty required from British troops would necessitate increased expense in constant reliefs, and this point is still left practically undecided, though separate enlistments for foreign service have been suggested. The age at which recruits are taken is important in considering the question of long or short service. In the British service recruits join the ranks at 18, but as many present themselves at 16, they are only half-grown lads unable to endure the fatigues of a campaign, whereas conscripts abroad do not become liable to military service till 20 and 21 years of age (France, Prussia, Austria 20, Russia 21), and are seldom really required till a year or two later. Neither has desertion materially diminished, though many men are now only enlisted for 6 years' army service.

The necessity for having self-supporting reserves is now, however, beyond question. Experience has shown that it is the only way of training large numbers and holding them ready for immediate service without enormous expense to the state. While in the reserve, each man earns his own living, and is at the same time subjected to periodical training, so that he may be fit to take his place in the ranks immediately on war breaking out. To each is assigned the duty for which he is best fitted, whether in the first or second line, in fortresses on the line of communications, or in garrisons at home; the youngest being recalled first, the rest as they may be wanted. This system has been brought almost to perfection in Germany, where it has been in force since 1807, and when war is declared the men from the reserve rejoin at once the same regiments and even the same companies, in which they originally served.

Men who are compelled to serve are naturally eager to return to civil life, but on the other hand men who voluntarily enlist mean probably to make the service a profession, and to pass them into the reserves is almost a punishment. Besides, continued liability to service (if the men are to be made to rejoin in case of war), presupposes some sort of registration and consequently compulsion. Even in Germany, many men are driven to emigrate rather than remain in the country, with the chance of military service for ever hanging over their heads, and consequently it cannot be surprising if in England, where registration is almost impossible, where the people are more migratory and independent, and where anything approaching compulsion is viewed with especial disfavour, the reserves would, in time of danger, not be forthcoming, and the army found to consist mainly of men serving in the ranks. Since proper registration is almost impossible, though it is enforced as far as it can be, men have been offered a retaining fee of £9 as an inducement to remain in the country, but it is hardly enough to compensate for loss of time taken up in occasional training, to say nothing of the liability to service in case of war. It appears also that in England many men in the reserves are refused civil employment, as the employers feel that the men may be taken from their work at any moment, perhaps even when their services are most required. It has been proposed, to obviate some of these difficulties, to increase the retaining fee considerably (up to £20), as the importance of being able to get the men at any time is beginning to be fully recognized, and it is only reasonable to give compensation for loss of employment and wages.

All that has been said in favour of voluntary enlistment in England applies with still more force to the United States, for the number of men required for the army (25,000) being so small a proportion of the population there is no necessity for resorting to compulsory service.

CHAPTER III.

RULES of ENLISTMENT for the ENGLISH ARMY.

England, as it has already been stated, adheres strictly to the system of voluntary enlistment. All the regulations, therefore, respecting enlistment must depend on the same principles as obtain in the ordinary relations of life, viz.: That there must be some immediate as well as prospective advantages to be gained by serving. The chief object consequently should be, to reconcile military with civil considerations, attaching equal importance to each, and to make the terms of military service consistent with the obligations of civil life.

The first point to be decided is the time men who enlist as soldiers shall be required to serve in the army.

The period of service in England has constantly varied. In the last century men enlisted for war only, and were disbanded at its close. The increase of our Colonial Empire led to enlistment for life (i.e., unlimited enlistment), which was in force at the commencement of the present century.

In 1806 limited service was first introduced: Infantry, 7 years; cavalry, 10 years; artillery, 12 years. In 1808 unlimited service was again introduced; a recruit being allowed to choose which he preferred.

In 1847 a "Limited Service Enlistment Act" was passed by Parliament; the periods of service were different for the different branches, ten years for infantry and twelve for the other branches. In 1867, the period was equalized for all, and was fixed at twelve years. In 1870, limited service was allowed to be modified by dividing the period between army and reserve service, at the discretion of the Secretary of State for War. In these last two acts re-engagements for 21 years were allowed to well-conducted men. In 1879, the Army Discipline and Regulation Act consolidated the provisions relating to enlistment in the Army Enlistment Act, 1870, the Mutiny Act and one or two other acts.

Thus, since 1847, the idea of having an army of men who mean to make the service a profession for life has been given up. The standing army must be, during peace, as small as is consistent with safety, to save expense; at the same time that, on war breaking out, it should be capable of immediate expansion. These conditions are obtained by short army and reserve service.

Enlistment in Great Britain is regulated by Acts of Parliament. The Enlistment Acts passed since 1847 are those under which men are now serving, but it will only be necessary here to give the details of the Enlistment Act of 1870 and of the Discipline Act, 1879.

The first point usually laid down is the period of service for the various branches, conditions of service, etc., and then the conditions under which men, if approved by their commanding officer, may re-engage for a further term.

Re-engagement is allowed in all countries, whether recruiting is carried on under a voluntary or compulsory system, whether the period of service for which the recruit originally enlisted is long or short. The object of allowing re-engagement is that the services of such men as are willing and efficient soldiers may be retained. The old soldiers furnish N.C. officers to train recruits, as well as men for other responsible posts. Now that the tendency of all laws of recruiting is to make the term of army service as short as possible, if re-engagement was not permitted, the ranks would consist entirely of young soldiers who would have little or no authority amongst their comrades.

Army Enlistment Act, 1870.

LIMIT OF ENLISTMENT:—Twelve years to be passed all in army service, or divided between army and reserve service in such proportion as was determined by the Secretary of State for War, and specified in the attestation paper, special provision being, however, made for continuing soldiers in army service in case of war. Proportions of army and reserve service may be subsequently modified by mutual consent of a Secretary of State and the soldier, after three years' service, either:

1st, To enter the army reserve force at once.

2nd, To extend army service for the whole period of twelve years.

RE-ENGAGEMENT.—Men in army service, within one year of completion of whole twelve years (or within three years if ordered on foreign service) may, if approved, re-engage to complete twenty-one years' service, after which only do they become entitled to pensions.

CONTINUANCE IN THE SERVICE:—Allowed after twenty-one years' giving three months' notice of wish to retire.

DISCHARGE :—At home, at once on completion of engagement.

PROLONGATION OF SERVICE.—Abroad, service may be prolonged for twelve months only, but the man should be sent home for discharge as soon as possible.

MODE OF RECKONING SERVICE.—Commencing from date of attestation (irrespective of age), all service counts towards limited engagement, which is not forfeited by reason of—

1st, Imprisonment by sentence of Civil Court or Court Martial.

2nd, Detention in the guard room awaiting trial, which results in conviction.

3rd, Desertion.

4th, Absence without leave, exceeding five days.

5th, Detention as a prisoner of war, if taken prisoner by neglect.

The provisions of this act are extended to men serving under former acts, but only with their own consent ; and all former rules inconsistent with the act are repealed. Immediately after the passing of this act, the Secretary of State for War published, as authorized by the act, the following rules of enlistment :

Enlistment for infantry may be either twelve years' army service (termed Long Service Enlistment), or six years' army and six years' reserve service (termed Short Service Enlistment). For other branches, twelve years' army service. Enlistment of boys as musicians or drummers only for twelve years' army service.

This was altered in 1871, when enlistments for foot guards and infantry were only to be for six years' army service and six years' reserve service. Re-engagement still allowed, but only for well-conducted men. In 1873 the Secretary of State for War authorized the Adjutant-General to direct from time to time what proportion of recruits should be enlisted in the infantry for long service (i.e., twelve years' army service), or short service (i.e., six years' army and six years' reserve service). Short service has been since 1874 applied to the cavalry, artillery, engineers and army service corps. Enlistments for cavalry and engineers were to be for eight years' army service and four years' reserve service, or for long service (twelve years), for army service corps the same as for infantry ; provided that any soldier, on obtaining his commanding officer's consent, may after three years army service pass at once into the reserve, and there complete the remaining portion of his engagement.

Army Discipline and Regulation Act, 1879.

The part of this act referring to enlistment consolidates the provisions relating to enlistment, which had previously been contained partly in the Army Enlistment Act 1870, partly in the Mutiny

Act, and partly in one or two other acts. As respects reckoning of service, the forfeiture of service, and liability to be detained in the service, this act only applies to soldiers enlisted *or re-engaged* after the passing of the act, and not to those previously enlisted or re-engaged without their consent.

PERIOD OF SERVICE.—In regular forces 12 years, or for such less period as may be from time to time fixed by Her Majesty.

TERM OF ORIGINAL ENLISTMENT.—1st, For the whole term of his original enlistment in army service, or

2nd, For such portion as may be determined by a Secretary of State, and specified in the attestation paper, in army service, residue in the reserve.

CHANGE OF CONDITIONS OF SERVICE.—A Secretary of State with a man's consent may vary condition's of service, either

1st, To enter the reserve at once at any time (formerly only after three years of army service).

2nd, To extend army service for whole period of twelve years.

A man in the reserve may be permitted to re-enter upon army service for any period not exceeding twelve years from date of original enlistment.

RE-ENGAGEMENT.—Men in army service, may, *at any time* within three years of completion of army service, if approved, re-engage to complete twenty-one years, reckoned from the date of their attestation, and inclusive of any period previously served in the reserve.

CONTINUANCE IN THE SERVICE.—Allowed after twenty one years giving three months' notice of wish to retire.

PROLONGATION OF SERVICE.—Abroad, or in time of war, service may be prolonged for twelve months only, but the man should be sent home for discharge as soon as possible. In time of war a man may agree to continue in the service until the end of the war, or until the expiration of three months after giving notice of his wish to leave the service.

MODE OF RECKONING SERVICE.—Commencing from date of attestation all service counts, which is not forfeited by reason of:

1st, Desertion.

2nd, Fraudulent enlistment.

On conviction by court martial of either of these offences, or upon his trial being dispensed with, the whole of his previous service is forfeited, and he is liable to serve for the term of his original enlistment reckoned from the date of conviction or order dispensing with his trial; but forfeited service may be restored for good service by a Secretary of State.

Under this act therefore soldiers do not forfeit service towards discharge for any absence or for any imprisonment.

System of Recruiting.

The next point to be considered is the method of obtaining recruits.

In times of great emergency officers have been allowed to raise battalions or companies of 100 men, receiving either commissions or promotion for doing so. The expense of raising men was found to be nearly the same as if the commission or promotion had been purchased. This plan was open to so many objections that it was seldom resorted to: and in preference, when difficulty was found in getting recruits, a sum of money, termed "bounty," varying from £1 to £10 used to be offered as an inducement to enlist. Bounty was also offered for re-engagement. The regulations now in force, relying on increased rates of pay and other advantages awarded to men in the army, state that no bounty is to be given. Recruits on joining receive only a complete kit free of charge.

Great Britain has lately (1873), been divided into a number of sub-districts for recruiting purposes in each of which there is a Brigade Depot commanded by a Lieut.-Colonel. In each Brigade Depot two infantry battalions are joined together for recruiting purposes and are called "linked battalions," two companies from each being stationed at the depot to carry on the recruiting. These two battalions relieve one another on foreign service, the intention being to have one battalion at home and the other abroad. To each military sub-district are assigned:

- 1st Two line battalions, one at home the other abroad.
- 2nd, The Brigade Depot.
- 3rd, The militia battalions in that district.
- 4th, The volunteer corps in that district.
- 5th, The infantry of the army reserve residing in that district.

Besides these there are artillery sub-districts consisting of the auxiliary and reserve artillery only, under a Lieut.-Colonel, and two cavalry sub-districts for the auxiliary and reserve cavalry also under a Lieut.-Colonel.

Recruiting for the regular forces is to be under the superintendence of the officer commanding the Brigade Depot. In each sub-district recruiting is to be carried on thus:

- 1st, For the sub-district brigade.
- 2nd, For brigades not belonging to the sub-district.
- 3rd, For special corps, viz.: Guards, cavalry, artillery, engineers, etc., etc.

All recruits are to be inspected before enlistment by a commissioned officer, and also medically inspected by a medical officer.

Recruits for the Brigade Depot are passed by the officer commanding the Depot, those for cavalry, artillery or guards by some officer belonging to those corps, but should any officer of these corps be at too great a distance recruits may then be passed by a field officer of the Brigade Depot.

ENLISTMENT.—On a man offering himself for enlistment, the person called "recruiter" who is specially authorized to enlist recruits, gives the man a form directing him to appear before a Justice for attestation. After answering the questions recorded in the attestation paper relating to age, condition, willingness to serve, etc., which are written down, he signs the paper and then takes the oath of allegiance; he is then deemed to be enlisted.

Similarly in the case of soldiers re-enlisting or re-engaging, a declaration of willingness to serve and of the period of service, has again to be subscribed by the soldier in the presence of a magistrate.

The recruit is allowed to choose any branch of the service, or even any particular regiment. If he has no particular preference he is enlisted for general service and is appointed to a corps as soon as practicable.

CHAPTER IV.

RESERVES for the BRITISH ARMY.

The standing army of each country is made up of the active army and the reserve.

The period of service in either varies in different countries, but the same principle is acknowledged, and acted upon thoroughly in continental European countries, that the reserves to fill up the ranks in the active army during war should all have passed through the army. The men forming the reserve on war breaking out, are required at once to take their place in the ranks, and when the system is properly established they rejoin the same companies, regiments, or corps in which they originally served.

The advantages of this system are that :

- 1st, The active army can be increased at once on emergency.
- 2nd, The men of the reserve are fit to take their places in the ranks when required.
- 3rd, They are liable to serve wherever required.
- 4th, Their services are retained at the smallest expense during peace.

The disadvantages are that :

- 1st, Reserves may not be forthcoming when required.
- 2nd, The training in the active army may not have been sufficient.

That the advantages of this system far outweigh the disadvantages is evident from its general adoption. In England, until quite recently, there were no reserves trained in the army itself, but reliance was placed on what are called the auxiliary forces, however, in 1867 an attempt was made to form an Army Reserve, which should correspond to the reserves existing in foreign countries.

The Army Reserve.

Such a force was first attempted to be formed in 1843 when an act was passed enrolling 10,000 pensioners.

In 1867 the *Army Reserve Act* was passed which consolidates and amends all former acts on this subject and limits the establishment of the reserve to 50,000—20,000 in Class I, and 30,000 in Class II.

At the beginning of 1880 the actual number of effectives of Class I was 16,651.

The 1st Class was to consist of men who have served for not less than 3 years in the regular army and not longer than the first period of enlistment, and whose age does not exceed 34. These men receive a retaining fee of £9 a year paid quarterly in arrear, and 2 pence a day deferred pay, paid at the end of each year; but they have no claim to pension.

Class II includes all persons already enrolled in former acts and are liable for service in the United Kingdom only. All enrolments in this class except of pensioners has been suspended.

Liabilities of 1st Class :

1st, To be called out for training for 12 days, or 20 drills annually.

2nd, Also in aid of the civil power.

3rd, In case of imminent national danger or great emergency, to be called out on permanent service by proclamation and posted for general service with the regular army when they are liable to serve at home or abroad.

4th, Bound to register their places of abode.

5th, Any breach of the law or regulations made by the Secretary of State for War will render them liable to be punished under the Army Discipline Act like soldiers, or proceeded against before a Justice.

6th, Any man who is absent twice when ordered to receive pay is to be treated as a deserter.

7th, Not allowed to emigrate.

8th, To be tried by Court Martial for fraudulent enlistment, if they re-enlist without permission.

Men enrolled are subject to military law, when they are :

1st, Embodied for training.

2nd, On duty, having volunteered their services.

3rd, Out in aid of civil power.

4th, Permanently embodied in case of war.

Officers.

In 1879 a reserve of officers was formed, which reserve is composed of the following classes :

1st, Officers, who have served in the regular forces and who are retired with pension or gratuity, are liable to be called out in case of national emergency when the soldiers of the army reserve are called out.

2nd, Officers retired without a liability to further service may apply for commissions as "Army Reserve Officers."

3rd, Officers of the auxiliary forces may hold commissions as army reserve officers in addition to their commissions in the auxiliary forces.

4th, Officers retired from the Indian Army may apply for commissions as army reserve officers.

Field officers are liable to remain in this force up to 55 years of age, other officers up to 45.

MILITIA RESERVE.—In addition to the regular reserve of men who have passed through the ranks of the regular army there is the militia reserve, which force forms part of the army reserve, but as the men enrolled in this reserve belong, when not called out, to the militia, an account of this force will be given with that of the militia.

Besides the reserves for the active army there are in England other forces to fall back upon in time of necessity known as the "Auxiliary Forces."

These are: 1st, Militia. 2nd, Yeomanry. 3rd, Volunteers.

The Militia.

The militia is the oldest military force of the country, dating from the year 1285.

Militia service is compulsory on every male and the ballot may be legally enforced for filling the ranks of this force, but the ballot has hitherto been kept in abeyance by an annual act of Parliament.

The militia are liable for service in Great Britain and Ireland only, but regiments of militia have often volunteered for foreign service during war and have served for several consecutive years.

This force is now under the Crown and the commissions issued to the officers are Crown commissions,—formerly it was under the Lord Lieutenants of counties.

Regiments are local and have permanent head-quarters and an administrative staff in their respective districts.

Recruits are raised by voluntary enlistment for 6 years. Recruiting is carried on at head-quarters by the adjutant and permanent staff as well as by militiamen themselves. The bounty is £6 divided into annual payments made at the end of each training which is limited to 27 days annually. Men who re-enrol for another 6 years get 10s per annum additional. The enrolment and re-enrolment of any man to serve in the militia takes place before a magistrate.

Militia recruits may be assembled for drill from 8 to 12 weeks including the annual regimental training, which is limited to 27 days, or they may be called up for three months' training immediately preceding the assembly of their corps, in which case they are not required to attend the regimental training for that year.

The permanent staff is under the orders of the officer commanding the Brigade District, and when embodied the militia are under the General Officer commanding the district.

The nominal establishment of the militia is 139,112 officers and men including the militia reserve, but the actual number present at the annual training in 1879 was only 113,484, the absentees (about 24,000 men) being, probably, "bounty-jumpers," that is men who are enrolled in two or more regiments at the same time.

This force comprises artillery, engineers and infantry ; artillery 18,237, engineers 1,317, infantry 119,558.

Officers of the militia are subject to military law at all times ; also the officers, N. C. officers and men of the permanent staff. N. C. officers and men only during preliminary training, during embodiment and during annual training.

Greater attention is being paid year by year to the training of this force. Militia regiments are annually assembled at the camps of instruction and brigaded with troops of the line. Still they cannot, in the opinion of many, be strictly called army reserves.

The principal objections urged against the militia are :

- 1st, Reserves should be of the same quality as the army.
- 2nd, Training insufficient, even for drill ; no time to establish discipline, obedience, mutual reliance, etc.
- 3rd, Not liable to foreign service.
- 4th, Uninstructed men require the most highly instructed officers while militia officers are generally inexperienced.

On the the other hand the arguments in favour of it are :

- 1st, Difficulties of applying short service enlistments in the English army.
- 2nd, Men enter the militia who would not enter the army.

Militia Reserve.

At the same time that the Army Reserve Act (1867) was passed by Parliament, the Militia Reserve Act was also passed and was designed to at once supply men with some training who would be available in case of war. Men who enlist in the militia reserve serve for the same period and are under the same liabilities as the ordinary militia except that they are liable for service in the army in case of war. They receive an additional bounty of £6, and an extra annual payment of 10s when re-enrolled. This reserve numbers about 30,000, the total number of men is not to exceed one-fourth of the whole militia. To enter the militia reserve men must be 19 years old, they must have served for at least two trainings and they have to be regularly attested before a magistrate.

Yeomanry Cavalry.

Yeomanry are strictly volunteers. They are organized in local troops of from 40 to 100. Regiments are formed by collecting from 4 to 8 troops. Men are not enrolled for any definite period and they can withdraw at any time on giving 14 days' notice. They find their own horses, but government provides arms and allows £2 per annum for clothing. There is a staff of one adjutant per regiment and one drill-sergeant per troop.

Their nominal strength is about 14,500, but only 10,500 were present at the annual training in 1878, the last time when they were called out.

They are liable to be called out in case of war or in aid of the civil power, but not to leave the United Kingdom. Training not to exceed 8 days annually,—recruits 12 drills. Allowances when out 7s a day.

The permanent staff are at all times subject to military law. Officers and men when assembled for exercise, on actual military service or when serving in aid of the civil power.

Volunteers.

The volunteer force, as at present constituted, was raised in 1858 when a panic of apprehended invasion induced men to enrol themselves for the defence of the country.

In 1804, long before the organization of the present force, about 450,000 volunteers were enrolled and volunteer acts were passed in 1802 and 1803.

The present force consists of light horse, artillery, engineers, mounted rifle and infantry corps. It is organized in local corps corresponding to companies, and when there are enough of them they are formed into battalions. Like the yeomanry, men are not enrolled for any fixed period, but can leave on giving 14 days' notice.

Volunteers are under the Secretary of State for War and they receive a yearly government grant of 20s to defray expenses. The men are classified as "efficient" and "non-efficient." The efficient are those who know their duties and have performed certain drills. The government grant is termed "capitation grant," and is made to corps at the rate of 20s a year, and 10s a year extra for each "efficient," whether officer or man. Officers and sergeants who have received special certificates obtain each an additional grant of £2 10s for the benefit of their corps.

Government provides arms and accoutrements; volunteers find their own uniform. Total strength in 1880, 245,648.

Volunteers become subject to military law under the same circumstances as Yeomanry except that they are not liable to be called out in aid of the civil power.

The whole available military force of Great Britain may therefore be divided into three great classes, viz.:

1st, The regular forces.

2nd, The reserve forces.

3rd, The auxiliary forces.

Their numbers for the present year (1880) are approximately as follows:

The Regular Army for Home Defence.....	108,859.
“ Army Reserve.....Class I.....	23,000.
“ “ “.....Class II.....	24,000.
“ Militia and Militia Reserve.....	139,112.
“ Yeomanry	14,511.
“ Volunteers	245,648.
Total.....	555,130.

Or, allowing for overestimates, for the Defence of the United Kingdom about	500,000.
Regular Troops in the Colonies.....	20,000.
“ “ in India.....	62,600.
Native Troops in India.....	123,000.

*Grand Total for the Defence of the Empire....705,600.

Marine Forces.

Sailors, including 4,000 boys actually afloat.....	37,000.
Marines	14,000.
Naval Reserve.....	23,000.

Total.....74,000,

In addition there is a small force of artillery and naval volunteers.

*Excluding local colonial troops.

CHAPTER V.

ORGANIZATION of the REGULAR ARMY.

INFANTRY.—The infantry is divided into regiments of one or more battalions, thus :

The Foot Guards consist of	3	Regiments forming	7	Battalions.
“ Rifles	“ 2	“	“ 8	“
“ Infantry of the Line	“ 108	“	“ 133	“

Total . . . 113 Regiments forming 148 Battalions.

The first 25 regiments have each two battalions and are attached to one and the same Brigade Depot,—the other regiments are also linked together in pairs and are termed “linked battalions” which also belong to the same Brigade Depot.

Each battalion consists of from 8 to 10 companies. The strength of each company on the peace establishment varies between 48 and 82 privates according as the battalions are required for home or colonial service. The war strength is from 100 to 120 men. Total force of infantry about 124,500 of all ranks, 45,795 being in India.

CAVALRY.—The cavalry are organized in regiments each of 4 squadrons, each squadron consisting of 2 troops, thus :

Life Guards	consist of	2	Regiments forming	8	Squadrons.
Royal Horse Guards	“ 1	“	“	4	“
Dragoon Guards	“ 7	“	“	28	“
Dragoons	“ 3	“	“	12	“
Lancers	“ 5	“	“	20	“
Hussars	“ 13	“	“	52	“

Total . . . 31 Regiments of 124 Squadrons.

Strength of Squadron—Peace Establishment,	50—60 files.
“ “ —War	80 files.

Total force of cavalry about 17,000 of all ranks and 11,600 horses, inclusive of 4,320 cavalry in India.

ROYAL ARTILLERY.—The Royal Artillery is organized in one regiment of 14 brigades, of which—

3	Brigades are	Horse Artillery.
6	“	Field
5	“	Garrison

A Brigade of Horse Artillery consists of 10 Batteries.

"	"	Field	"	"	14 or 15	"
"	"	Garrison	"	"	18 or 19	"

The actual number of batteries being :

Horse Artillery	30	Batteries with	180	Guns.
Field	"	85	"	510

Total Mounted Batteries..	115	with	690	Guns.
Garrison Batteries...	91			

Total number of Batteries 206

Add to each brigade 1 depot battery. Total about 220 batteries.

Peace Strength (approx.) per battery Horse Art. 142 men, 113 horses.

"	"	"	"	Field	"	140	"	85	"
War	"	"	"	Horse	"	185	"	206	"
"	"	"	"	Field	"	197	"	184	"

A garrison battery numbers about 100 or 120 men. There is also the coast brigade numbering about 1000 men. The total strength of the artillery is 35,241 with 12,164 horses. The Indian establishment is 12,081.

At Malta there is the Royal Malta Fencible Artillery consisting of 6 garrison batteries with a total of 371 of all ranks.

ROYAL ENGINEERS.—This corps is divided into 43 companies and 3 troops, thus :

Field Companies with a proportion of Wagons,	4	companies.
Sub-marine Mining or Torpedo.....	4	"
Surveying.....	4	"
Postal Telegraph.....	2	"
Garrison.....	23	"
Depot (2 recruits, 4 field works).....	6	"

Total.....43 companies.

1 Pontoon Troop—120 yards of bridge	} 3 Troops.
1 Telegraph Troop—45 miles	
1 Depot Troop	

Total strength about 5,651 of all ranks, of whom 428 are in India.

Non-Combatant Forces.

The non-combatant branches of the army for purposes of Supply consist of the :

- 1st, Commissariat and Transport Department.
- 2nd, Ordnance Store Department.
- 3rd, Pay Department.

The two former are under the Surveyor General of Ordnance. The Commissariat and Transport Department remains charged with the same duties as were previously carried out by the Barrack, Commissariat and Purveyor's Departments as well as by the Transport Service, formerly known as the Military Train, and is under the Director General of Supply.

The Barrack Department had, as its name implies, to do with the allotment of barracks and had charge of all barrack furniture and barracks in use by the troops.

The duties of the Commissariat were to provide and issue all supplies connected with the provisioning of troops by contract or otherwise.

The Purveyor's Department had to carry out the financial affairs and expenditure of hospitals.

The Military Train, formed after the Crimean war as a land transport corps to carry on all transport duties, was strictly a military force with duties of a non-combative character, but as transport is so intimately connected with supply it was considered that the transport service should be under the officer responsible for supply.

The transport service, now known as the Army Service Corps, is attached to the Commissariat. It consists of 16 companies on the peace establishment capable of expansion to 32 companies on mobilization. Each company contains a personnel both for transport duties and duties of supply.

A company on the war establishment ranges from 182 of all ranks with 83 carriages to 230 of all ranks with 127 carriage.

Total numbers Army Service Corps about 3,000.

The Ordnance Store Department is under the Director General of Artillery and Stores, and supplies all stores and munitions of war for all branches of the army and auxiliary forces as well as for the navy,—except clothing and necessaries. Total numbers about 600.

Under the Surveyor General of Ordnance, besides the two great branches of the "Commissariat and Transport" and the "Ordnance Store," are two minor branches, one for contracts and the other for clothing.

The Financial or Pay Department has to deal with all matters connected with the pay of officers and men and military expenditure generally. It receives, disburses and accounts for all monies receivable or payable for military services under the orders of the Secretary of State for War.

The Commissariat and Transport, and the Ordnance Store Departments are, as concerns officers, both divided into two sections. The officers of the Superior Section are officers of the army who have volunteered and serve under their military commissions. After 10

years' service in one of these departments they may elect (if approved) to remain permanently in the department or they may revert to their regiments, or to half pay.

The army rank and staff grades of these officers is as follows :

	Commissariat and Transport Department.		Ordnance Store Department.
Maj. General.	Commissary General.	}	Commissary General of Ordnance.
Colonel.	{ Deputy Commissary General. }	}	Deputy Commissary General of Ordnance.
Lieut.-Colonel after 5 years, Major on appointment.	{ Assistant Com- missary General. }	}	Assistant Commissary General of Ordnance.
Captain	{ Deputy Assistant Commissary General. }	}	Deputy Assistant Com- missary General of Ordnance.

Officers of the Subordinate Section hold commissions from Her Majesty and are called Quarter-masters, and will consist of warrant officers promoted.

Officers of the Pay Department are also to be volunteers from the regular army and are called Paymasters.

Army Medical Department.

This department is under the Director General of the Army Medical Department. Till lately in the British service one or two medical officers belonged to every regiment and the hospital system was regimental. The arguments in favour of this regimental system are that the personal knowledge of a doctor with patients tends to good feeling and confidence, soldiers' constitutions are better known, malingering is more easily discovered, and that men remaining under the commanding officer's supervision are better cared for.

In war time the regimental system could not be maintained, as General Hospitals then become necessary ; so that there were formerly two systems, one for peace and the other for war, which was objectionable. It was also found extravagant in personnel and materiel and it caused inequality in the distribution of work. Recently the general hospital system has been adopted, and all the medical officers belong to the Army Medical Department and wear the uniform of this department instead of being regimental officers wearing the uniform of the regiment.

At large military stations are established general hospitals and at smaller ones station hospitals all under the entire control of officers of the Medical Department.

Under the orders of the medical officers is a force called the Army Hospital Corps, strength 1,942, who perform all the subordinate hospital duties.

Medical officers are commissioned officers and have the following ranks and relative ranks :

Major General	} Director General.
	} Surgeon “
Colonel	Deputy Surgeon General.
Lieut. Colonel ...	} Brigade Surgeon.
	} Surgeon Major after 20 years' service.
Major	Surgeon Major of less than “ “
Captain	Surgeon.
Lieutenant	Surgeon on probation.

Entrance to this department is partly by competitive examination and partly by appointment of the Secretary of State to candidates proposed by the governing bodies of public schools of medicine in the United Kingdom and Colonies, as being duly qualified according to a certain prescribed standard.

Not less than half the number of vacancies are to be filled up by competition.

Surgeons on probation have to undergo instruction in Ambulance and Hospital corps duties, and then go through a course in the Army Medical School. After passing the necessary examination, they are, if approved by the Director General, commissioned as surgeons.

Further Organization Required in War.

1st, Bearer companies to collect and remove the wounded from the battle-field to ambulances.

2nd, Their conveyance in ambulances to Field Hospitals.

3rd, The establishment and maintenance of Field Hospitals for the wounded until they can be removed to more permanent hospitals in rear.

4th, Permanent or General Hospitals on the line of communications,—so that the Field Hospitals may be cleared out and enabled to accompany the army and be as free as possible.

General Hospitals should not be larger than for 500 to 600 patients, and men should be cleared out of these whenever possible to convalescent depots.

A general hospital should be under a Military Governor, and for every 40 sick a medical officer and about 5 attendants are required. As a general rule accommodation will be required in general hospitals at the rate of 1,400 beds for each army corps.

Convalescent depots under a purely military staff are established on the line of communications to give men rest and enable them to rejoin the army when fit. These depots have generally been made to accommodate from 500 to 1,000 men.

When near the sea or large lakes Hospital Ships are invaluable.

A well organized ambulance establishment with an army is very important, as the moral effect on the men of a well organized system in which every man who falls is taken care of, is great. The idea of remaining all night, or longer, on the battle field has a depressing effect on the minds of the men, who fear this more than the actual wound or even death.

The withdrawal of men from the fighting ranks to carry wounded to the rear has often had great influence on the success of the day by diminishing the fighting force, and yet this is an evil which no general has been able fully to check in spite of orders issued to the contrary, as besides the desire of some to get to the rear out of danger there is a natural impulse to help a comrade. In the British service bandsmen used to be employed for this service, but it is generally admitted that those who have close intercourse with fighting men should see as little as possible of the havoc among the wounded, and certainly that no fighting men should be employed for this service.

The proportion of sick of an army in the field is estimated at 10 per cent. and 16 per cent. of wounded, total 26 per cent. as a maximum, diminishing to 15 per cent. as a minimum.

The strength of ambulance detachments for the carriage of wounded varies with the unit to which they are attached. An ambulance detachment attached to an infantry brigade consists of 4 surgeons and 27 ambulances. An ambulance wagon carries 6 patients sitting and 2 lying on ambulance stretchers, and has an army hospital corps attendant and one driver.

The wounded, when collected on the battlefield, are carried on stretchers to the ambulances to which they are then transferred and conveyed to a Field Hospital. A Field Hospital is the unit of organization and has accommodation for 200 beds. Its staff consists of 7 medical officers, 1 captain of orderlies, 37 N. C. officers and men of the Army Hospital Corps, 17 drivers, 6 wagons and 24 horses, and each hospital establishment is capable of sub-division into two parts.

Ambulance detachments follow the troops on the field of battle but are kept as far as possible out of fire, Field Hospitals follow about one day's march in rear. Of the 6 wagons belonging to a Field Hospital, 4 are hospital wagons, and each contains equipment for 50 sick, two are surgery wagons each for 100 wounded. The medical establishment belonging to the different units on a war footing is shown in the tables on pages 10-12.

Veterinary Department.

There is a Principal Veterinary Surgeon over this department, and surgeons are posted to stations and also sometimes attached to

regiments of cavalry and batteries of artillery. A veterinary surgeon is attached to each infantry and cavalry brigade, to each division and also to each army corps.

It is considered that there should be a veterinary surgeon to every 400 horses, and under his orders a farrier and a shoeing smith for every 50 horses that he has charge of.

CHAPTER VI.

PAY and ALLOWANCES.

The money required for the payment of the army is voted annually by Parliament in the army estimates brought forward by the Secretary of State for War, and is applied to the purposes specified in the estimates under the direction of the Secretary of State. The total sum is divided amongst corps and regiments, and is issued from the War Office on monthly requisitions through the Paymaster.

Formerly there was a Paymaster to each regiment or battalion, but now Paymasters are appointed to stations.

The Paymaster enters into no cash transactions with the men. Advantage is taken of the divisions of regiments and battalions into troops, batteries and companies to make the officers commanding them responsible for the payment of the men under their command. The money required for the payment of his men is estimated for in advance by the captain and received weekly from the paymaster. This sum, he, with the assistance of a pay-sergeant, expends in paying and discharging some of the liabilities of the men, and at the end of every month he furnishes the paymaster with a pay-list showing how the money has been expended and how his account with the public stands.

The captain has therefore to look to the correctness of his accounts with:—

- 1st, The men of his company.
- 2nd, The pay-sergeant.
- 3rd, The paymaster.

But if accounts go wrong between him and his pay-sergeant the captain is wholly responsible.

The whole rate of daily pay of each man is credited to him, but the money spent for him for certain authorized charges has to be deducted from him in his monthly account.

The daily pay of a private of infantry is 1s and of a sergeant 2s and 1d. Additional pay is granted as a reward for good conduct,

called good conduct pay, to soldiers under the rank of sergeant according to a given scale :

1*d* a day after 2 years' service.

2*d* " " 6 " "

3*d* " " 12 " " and so on.

In case of entries being made against a soldier in the Regimental Defaulter's Book he forfeits one good conduct badge for a specified time (one or two years) for each entry.

DEFERRED PAY.—Men, whether in the army or reserve, are credited with deferred pay at the rate of 2 pence a day for all ranks during the first 12 years' service. No part of it is ever paid to them until their army service is completed and never before 6 years, even if the soldier is part of this time in the reserve.

ALLOWANCES.—A ration of bread (1 lb.) and meat ($\frac{3}{4}$ lb.) is issued daily, when possible, to every soldier, free of charge. When rations cannot be issued, men on duty or furlough receive 6*d* a day in lieu.

Service toward good conduct pay and deferred pay are forfeited on conviction of certain offences by Court Martial, or when awarded as a punishment by such a Court.

Authorized Stoppages from Soldiers' Pay.

Daily stoppages when at duty :

For groceries, vegetables, etc., 5*d*. Washing, $\frac{1}{2}$ *d*. The total daily charge for messing and washing is not to exceed 5 $\frac{1}{2}$ *d*. Sergeants may spend what they like subject to control. There are also certain daily stoppages when in hospital, and a monthly one of 1*d* for hair cutting.

Some of the other authorized stoppages are :

To replace necessities, marking clothing and necessities, armourers', tailors' and shoemakers' charges, barrack damages, fines for drunkenness and other stoppages from pay inflicted by Court Martial or by the Commanding Officer.

Forfeiture of pay for absence, imprisonment, etc., is dealt with under Military Law.

RESERVE PAY.—Men of the reserve receive 4*d* a day which is paid at the end of each quarter.

PENSIONS are sums of money allowed at daily rates to soldiers on leaving the service.

Permanent pensions are only given for long service (21 years), good conduct, discharge for disability through wounds received in action, or injury in the service. Privates after 21 years' service receive from 8*d* a day to 1*s* 3*d* when they have a certain number of good conduct badges,—N. C. officers get more, the maximum being 3*s* a day.

Temporary pensions are granted for short periods (from 1 to 18 months when under 7 years' service, more for longer service) when soldiers have to be discharged before completing the whole term of service for which they enlisted on account of ill health or other causes.

Soldiers of good character may obtain their discharge, if approved, before completion of their engagement on payment of certain sums of money according to a regular scale.

Certain sums are voted annually for annuities and gratuities: Annuities not exceeding £20 with or without a medal are granted for "Meritorious Service" or "Distinguished Conduct in the Field." Gratuities not exceeding £5 with medals are granted for long service and good conduct; for these a soldier must have served with an irreproachable character for at least 18 years.

Supply and Transport in Peace.

[This Subject in time of War will be treated separately].

All matters relating to the supply and transport of the army are the business of the "Commissariat and Transport Department."

Supplies of troops during peace consist of:

- (1). Food.
- (2). Quarters, fuel and light.
- (3). Medical attendance.
- (4). Equipment.
- (5). Clothing.
- (6). Necessaries.

(1). The rations of bread and meat are issued free and are usually obtained by local contracts. The supply is not sufficient for three meals and is supplemented by the purchase of coffee, vegetables, etc., (known as groceries) within a specified amount, and paid for by the men who also do their own cooking.

FORAGE for horses is supplied by contract. Daily allowance for each horse is hay 12 lbs., oats 10 lbs., straw 8 lbs.

(2). Quarters are provided either in barracks, huts, tents, or billets. Supplies of fuel and light are also granted free. The number of men that can be accommodated in any one room or hut is determined by authority, according to size of room, climate, etc., 600 feet per man being the minimum. Billets are quarters for troops on the march, when soldiers are billeted in hotels, inns and public houses.

(3). In the army all ranks are entitled to medical attendance free hospitals being provided at every station. Soldiers are always sent to hospital when unfit for duty.

(4). EQUIPMENT is the term used to denote the arms, appointments, accoutrements, great coats, and leggings. These are all the property of the government and if returned into the store will be re-issued if serviceable.

(5). CLOTHING includes those articles, which, being issued free by government, are required to be kept in wear a certain time, and then become (with the exception of the head-dress) the property of the soldier. If soldiers do not require the clothing they are entitled to, they receive its value in money. Infantry receive annually 1 serge frock, 1 pair of trousers, 2 pairs of boots, and biennially 1 tunic and 1 pair of summer trousers.

(6). NECESSARIES.—This is the general name for the remaining articles of a soldier's kit. A certain complement has always to be kept up, it is first issued free and then kept up at the soldier's expense. They can usually be obtained from government stores at prices fixed by regulation.

The total value of an infantry soldier's kit is about £2 and consists of a forage cap, shirts, towels, socks, brushes, etc.

Supplies on board ship are furnished entirely by the naval authorities. For long voyages men are provided with extra clothing, called a sea kit, for which they pay for themselves.

TRANSPORT for the army during peace is performed by the Army Service Corps, the wagons of which carry about 30 cwt.

CHAPTER VII.

SKETCH of DIFFERENT MILITARY SYSTEMS.

The German Empire.

The German army has been chosen first, for its organization is most complete, it has succeeded in war, and it now serves as the model for other nations to copy.

The basis of the Prussian system has, since the beginning of this century, been universal compulsory service and no substitution has been permitted. This system arose not from choice but from necessity. After the Prussian overthrow in 1806 at Jena, Napoleon dictated terms at the treaty of Tilsit limiting the Prussian army to 43,000 men. This limitation necessitated a scheme for providing more men, and consequently as soon as soldiers became efficient they were sent on furlough and replaced by others.

This system succeeded, for when Prussia joined the allies in Belgium in 1815 she had about 264,000 men all more or less trained to arms, and when once trained men called from civil life were found reliable soldiers, the standing army was thenceforth used as a school for the reserves.

The liabilities to service were altered from time to time. In 1867, when, as a result of the Austro-Prussian war the North German Confederation was formed with a population of 30 million, a new law was passed consolidating the old ones and fixing the strength of the army at one per cent. of the population. This law was in force throughout the Franco-German war and until the law of 1874 came into operation for the whole German Empire.

The annual contingent is not fixed by law, but regulated by the number of men required for the peace establishment which was fixed at about 401,000 for 7 years, for which an annual contingent of about 145,000 was required. The total population including Alsace and Lorraine is about 43 millions.

For military purposes, both for recruiting and organization, the Empire is divided into provinces, to each of which is assigned one or more corps d'armée.

Prussia	{	1 Guard Corps(recruited from the whole Kingdom)
	}	13 Corps.
Saxony		1 Corps.
Wurtemberg	1	"
Bavaria	2	"

—
Total . . . 18 Corps d'armée.

One Division is furnished from Hesse in addition.

Of these 18 corps, the Guard corps is recruited all over Prussia, but each of the other 17 corps has a separate recruiting division corresponding to the civil divisions. Each of these corps districts is divided into 4 parts one to each brigade of infantry composing the corps. Each of these is again sub-divided into 4 parts called Landwehr Battalion Districts which correspond to small civil divisions. There is also a 17th Landwehr Battalion District to each corps for the purpose of filling up gaps in any sparsely populated sub-division.

A Landwehr regiment consists of 2 battalions and corresponds to the similar line regiment in number and everything. A line regiment has 3 battalions and occupies the same recruiting area as the Landwehr regiment. The Landwehr regimental staff is not maintained in peace time, but the battalion staff is and it constitutes the chief recruiting agency. The Landwehr battalion is only called out twice in 5 years in peace time for a few days' training.

Men, after serving with the colors, generally return to their civil employment in the same locality they were recruited from during their reserve and Landwehr service as they pass into their corresponding Landwehr regiment. Each Landwehr battalion district is divided into company districts corresponding to the lowest civil division with the Sergeant Major at the head.

The Regiment is the German administrative unit, and the Battalion the tactical unit, but as Landwehr regiments do not exist in peace time, administration is carried on by Landwehr battalions.

The military forces of the Empire may be divided into 3 great classes: The Standing Army, the Reserves and the Landsturm.

Of these, the army and reserves form 4 distinct classes, viz:

1st, The Standing Army, men actually in the ranks.

2nd, Reserves, men who have passed through the ranks.

3rd, Landwehr, men who have served 7 years in the army and reserve, and then form separate battalions.

4th, Ersatz recruiting reserve: Untrained men to be called into the depots in case of war.

Every man is liable to service at the age of 20 :—3 years in the ranks, 4 years in the reserve, and 5 years in the Landwehr. Lists are kept of all young men attaining the age of 20 in every year and these have to appear before recruiting commissions assembled annually in each Landwehr battalion district. These commissions move about in the district and consist of officers, civilians, and one medical officer. Their operations are subsequently revised by brigade recruiting commissions, and these again by the Army Corps commission. The War Office, which is at the head of all, fixes the number of men required per province and the number is then sub-divided downwards. Recruits appearing before the lower commissions are first examined as to physical fitness and legal condition to serve. Men wholly unfit are exempt altogether, and convicts are excluded as unworthy to serve. Weakly men, unfit for combatant service, are passed into the Ersatz reserve, but have to appear year by year in the event of their becoming fit for army service, but by the third examination, if still unfit, they are placed for good in the Ersatz reserve.

Legal exemptions are granted for family circumstances or professional pursuit, such as, the only son of a widow, the brother of one who has died under the colors, etc. The liabilities of medical and art pupils are only postponed until their studies are completed.

When the weeding out has taken place lots are drawn for the numbers required, after which a selection is made for the guard and other corps.

Men not required belong to the Ersatz reserve, but they have to present themselves every year for 3 years when they are liable to have to serve, and it is at the end of this time only that they are permanently classed in the reserve.

THE ERSATZ RESERVE is divided into two classes. The 1st Class is composed of men fit for the ranks who would have been called into them if they had been required, they remain 5 years in this class. The 2nd Class is composed of men who have served 5 years in the 1st Class, and men unfit for combatant service but suitable for the non-combatant branches ; they are liable up to 32 years of age.

There are also voluntary modes of entering the army, viz : 3 year volunteers, 1 year volunteers and avantageurs or cadets.

THREE YEAR VOLUNTEERS.—Any young man of 17, medically approved, with a good conduct certificate and his parents' permission may enlist voluntarily. The advantages he obtains by so doing are that he can select his own regiment, and finishes his military service early. Forty of these volunteers per battalion, is the limit allowed. After 3 years' service he joins the reserve and at the usual age of 27 the Landwehr. Cavalry volunteers usually serve 4 years.

ONE YEAR VOLUNTEERS.—Young men of good education and means to defray all expenses, may become one year volunteers. They must be between 17 and 20 when they present themselves, have a good conduct certificate and their parents' permission, but they need not join till their 23d year, and doctors not till their 27th year, but this postponement of service is limited to peace time. They are required to pass an examination; four per company is the limit in peace time but there is no limit in time of war. During their short service special facilities are offered them to qualify for commissions in the Reserve and Landwehr. After 6 months' service in the ranks they become N. C. officers and at the end of the year pass an examination to qualify for officers or N. C. officers. After their year's service they join the Reserve, and the Landwehr at 27. The system of one year volunteers has been adopted by most powers. The advantages to the individual are, that he may choose the period to serve, which therefore interferes less with his private profession, he may also choose his own regiment, and may serve according to his profession as a doctor, veterinary surgeon, etc.

The benefit to the State and the army are that soldiers are obtained without cost, an educated class is distributed in the ranks, and a large supply of officers is obtained in the event of mobilization.

THE AVANTAGEUR enters the service on purpose to become an officer without passing through one of the cadet colleges. He is nominated by the colonel of a regiment and is required to pass an examination and afterwards a professional examination. He serves six weeks as a private, messing with the company, etc. After 6 months he may, if approved by the colonel and other officers, enter their ranks as an ensign.

Re-engagements are allowed in the army for N. C. officers, useful men, etc., and they then receive a higher rate of pay. When a re-engaged man has served 7 years with the colors he goes straight to the reserve. Subordinate civil posts are kept open for N. C. officers and re-engaged men.

RESERVE.—Soldiers in the reserve are liable to take part in two manœuvres not exceeding 8 weeks during their reserve service.

Many men do not serve their full 3 years in the standing army. After they are efficient soldiers, sometimes in two years, they are sent home on furlough (being liable to recall) and their places are filled up from their own year's class. The chief object of this is to train more men without expense or observation.

LIABILITIES OF THE ERSATZ RESERVE.—Men of the 1st Class must keep the recruiting authorities acquainted with any change of residence. They may emigrate but must give full particulars and are bound to return to their country in case of mobilization, unless at that time specially exempt. When called out most of them are incorporated in Landwehr battalions. It is intended in future, on

first mobilization, to mobilize mixed battalions of Landwehr, each to consist of 800 trained Landwehr men and 400 untrained Ersatz reserve men.

When mobilization terminates the Ersatz reserve men, being then regarded as trained men, leave this reserve and are classed in the Army Reserve or Landwehr according to their age, 27 being the universal age for joining the Landwehr. The 2d Class Ersatz reserve are exempt from all control on the part of the recruiting authorities, but can be enrolled in the army by Royal Edict.

LANDSTURM.—The Landsturm embraces the whole male population fit to carry arms from the age of 17 and upwards without limitation as to age. There are two classes—the 1st Class includes all men up to 42 years of age, and the 2nd Class men over 42.

The Landsturm may be embodied by Imperial decree in case of threatened invasion or hostile occupation. When called out they serve under the same rules as the Landwehr and wear the same uniform. They are generally formed in separate units, but they may be drafted into the Landwehr or even as a last resource into the regular army. They are called out by classes commencing with the youngest as far as military interests permit. When not embodied they are under no military control. This liability to embodiment on threat of war gives great power to the crown,—also their being liable to fill up gaps in the army makes it not purely a defensive force, as the Landsturm is in consequence liable to serve anywhere. In the event of internal troubles occurring in Germany any district can be placed under Martial Law by calling out the Landsturm.

ACTIVE ARMY.—The peace establishment of an infantry battalion is about 540 men excluding officers, and the war establishment nearly 1,000,—thus on mobilization each battalion requires about 460 men to complete it to war strength. A fourth battalion of 1,000 men is also raised for each regiment as a depot battalion, and thus each regiment requires about 2,400 men,—to supply these there is the reserve.

A regiment passes annually from 500 to 550 men into the reserve, and as the reserve service is 4 years there will be over 2,000 men from this service, sufficient to make up the field battalions and give a nucleus for the 4th battalion which is filled up from the Ersatz Reserve.

A cavalry regiment (of which there are 93) is in time of peace kept nearly up to its war strength, it then consists of 5 squadrons each of 140 troopers. The war establishment is 4 squadrons and numbers about 600 horses, and the 5th forms a depot squadron of about 200 horses.

A cavalry regiment passes annually from 100 to 150 men into the reserve, and as they serve 4 years in the reserve and 3 in the

Landwehr, they have about 500 in the reserve and 350 in the Landwehr. These surplus men go to form gendarmerie, train, and reserve cavalry regiments.

ARTILLERY.—Every corps d'armée has two field regiments of artillery attached to it. For war the two regiments are raised from about 1,850 to 6,450 men, with 6 guns instead of 4 per battery as in peace. Total 17 batteries of 102 guns. Each regiment forms besides a depot of two batteries. The reserve is only able to supply some 2,000 men, and the rest are taken from the Landwehr, and foot artillery reserves are sent to fill their places. The Cavalry Reserve also supply men for duty with ammunition columns, etc.

SUPPLY OF HORSES.—Horses in peace time are purchased in the open market at about 3½ years of age and sent to remount depots where they are trained until they are 5 years old. There are also government studs for breeding chargers. A charger when sent to a regiment is supposed to last 9 years. For mobilization a large number of additional horses are required, and every horse in the country is liable to be taken. A list of all the horses in a Landwehr battalion district is kept by its commander and revised annually. The number required for each district is detailed by the corps commander, and each owner is told where to bring his horse. A committee of reception sits to choose the horses, and a valuation committee value each horse and the owner is paid. A few horses such as doctors', magistrates', etc., are exempt from this ballot.

The active army numbers about 401,660,—the annual contingent being nearly 145,000. Omitting men belonging to the Landsturm over 42 years of age, as these would only be utilized as a very last resource, the reserves of the Imperial forces yield a grand total of about 5,800,000 men as follows:—

TRAINED PORTION OF THE RESERVE.

(1). Army Reserve consisting of 4 contingents of 125,000 men	500,000
(2). Landwehr, 5 contingents of 116,000 men	580,000
(3). Landsturm, 10 contingents of 103,000	1,030,000
	2,110,000

UNTRAINED PORTION.

(1). 3 Classes from 17 to 20 years of age of 283,000 men	849,000
(2). 11 Classes of Ersatz Reserve of 140,000 men	1,540,000
(3). 11 Classes of Landsturm (untrained portion) of 118,000 men	1,298,000
	3,687,000

The difficulty which has been experienced is the provision of trained officers for the trained portion of the Landsturm, nevertheless

it is estimated that no less than 500,000 Landsturm men can be formed into battalions, provided with the necessary proportion of officers,—and arms for the whole force are in possession of the government. Every effort is being made to organize and officer the whole trained Landsturm force and doubtless in a few years this will be accomplished.

The sources from which a supply of reserve officers are obtained are the following :

1st, Officers capable of serving, who have quitted or been removed from the active army before the completion of the legal term of seven years.

2nd, Officers leaving after the expiration of their legal term, every inducement being offered them to join the reserve.

3rd, Non-commissioned officers or men who have specially distinguished themselves before the enemy.

4th, One year volunteers who succeed in obtaining the necessary qualifying certificate as reserve officers. This is the principal source of supply.

5th, Non-commissioned officers of the reserve who may obtain the necessary certificate subsequent to the expiration of their term with the colors.

THE MOBILIZATION of the German army in the event of war would be carried on according to a secret annual scheme,—there are also known regulations. The Germans carry out the principle of decentralization and sub-division of work. A corps commander is held responsible for every matter connected with his corps,—all arrangements are made under his authority, and he submits the annual scheme to the War Minister.

The points considered in the scheme are :

- (1). To complete the active battalions to War Strength by calling out the reserves.
- (2). To form their depots.
- (3). To call out the Landwehr.
- (4). Garrisoning and arming fortresses.
- (5). Additional staff. Every staff officer who moves to the seat of war being replaced by another officer already named.
- (6). Forming the auxiliary services for war.
- (7). Command and staff for the line of communications.

The annual scheme shows the strength of the different corps, how the depots are to be formed, which officers are to take separate duties, etc., all are told off to their place.

On the first day of mobilization the Berlin War Office telegraphs to all the Landwehr Battalion Commanders, besides transmitting orders through the Corps Commanders. During the first 3 days notices are sent to each individual, who are given 24 hours to make their arrangements, through the civil magistrate. These notices are kept ready addressed to each individual, and the date only has to be filled in. The place of collection is generally the head-quarters of the Landwehr Battalion District where the sergeant majors attend to muster the men and they are then sent off in batches to their regiments; thus the reserve men reach their regiments in 4 or 5 days, where they find their arms and clothing ready for them. Meanwhile the regiment firms its depots.

In 1870 many regiments began to move on the 7th and 8th day of mobilization. The whole army is supposed to be ready by the 12th day.

That part of the Landwehr which is called out muster on the 6th day, i.e., after the reserves have gone to their regiments.

Establishments on a War Footing.

BRIGADE OF INFANTRY :—Two regiments, or 6 battalions, numbering 6,366.—Each battalion is divided into 4 companies of about 250 men.

DIVISION :—Two brigades of infantry, 1 regiment of cavalry (4 squadrons), and one division of artillery (4 batteries). Total force 14,066.

ARMY CORPS :—Two divisions of infantry, 1 battalion rifles (25 battalions), 2 regiments of cavalry one for each division, one Division of Cavalry composed of 2 brigades of 2 regiments each. In the field the Cavalry Division is attached to the army not to the corps. Two regiments of artillery—one regiment has 8 field batteries attached to the divisions, the other regiment forms the Corps Artillery of 6 batteries, and 3 horse artillery batteries attached to the Cavalry Division. 1 Pioneer Battalion (corresponding to our engineers). 1 Transport Battalion. Total strength 918 officers, 37,000 men, 102 guns and about 12,000 horses.

According to the new Army Bill which is to come into force in April 1881, the peace establishment of the German army is to be increased by about 25,000 men making it more nearly approximate to 1 per cent. of the population, or 443,880 including over 18,000 officers. There will be in addition 3,610 doctors, paymasters, etc., and 83,840 horses. The German army will by then be composed of 196 infantry regiments, 93 cavalry regiments and 340 batteries of artillery.

These additions will raise the war strength of the German army to about 1,405,000 men, and will materially improve the proportion of the three arms. Hitherto Germany has been superior in point of

cavalry, but inferior in infantry and artillery, and the new increase adds 11 infantry regiments, 40 batteries of field artillery, 1 regiment of garrison artillery and 1 battalion of pioneers to the army.

This increase in the artillery shows that the Germans do not agree with those English military writers, who, basing their conclusions on the results of the Russo-Turkish war, think that the value of artillery has decreased owing to improvements in the infantry fire arm, and that this arm may consequently be reduced in strength.

One very important feature in this new Bill is that it provides for the training of the Ersatz Reserve. The 1st Class will be liable to 4 periods of training,—the first two of 8 weeks and the last two of 2 weeks each. Men thus exercised will remain in the 1st Class until the completion of their period of service, i.e., for a total of 12 years. The number of men to be drafted annually into the Ersatz Reserve will be increased to about 50,000 or 60,000. When this new Bill comes into full operation, men drafted from this reserve into the ranks of the regular army on mobilization will be to some extent trained men. This is of the greatest importance, as in future the fighting value of the German army at the first outbreak of war will be greatly increased by drafting into the ranks men fit to take their place instead of, as hitherto, perfectly untrained men.

The Empire will, by this measure, be in a position to place 20 army corps on the frontier in a week, the Landwehr can furnish at least 12 more army corps, and the Ersatz Reserve in 3 years will furnish 150,000 men partially trained or the making of 6 more army corps, equal in all to 38 corps complete, and this without counting the men of the 2nd Class Ersatz Reserve and the Landsturm.

The German military system has been entered into at some length as it has been the most complete and has acted as a model on which France, Austria, Russia and Italy have based their systems and these need therefore only receive a slight sketch.

Organization of the French Army.

The country is divided into 18 military districts, to each of which is assigned a corps d'armée. The troops in Algeria form a 19th corps.

Recruiting is carried on in a similar manner to the German, liability to service commencing at the age of 20. As in the German army, volunteers may join at an earlier age (18), and there are also one year volunteers.

The forces are divided into :

1st, The active army with its reserve.

2nd, The territorial army with its reserve.

PERIOD OF SERVICE.—In the ranks.... 5 years.
 “ “ reserve... 4 “

—
 Total.... 9 years.

In the territorial army 5 “
 “ “ “ reserve 6 “

—
 Total.... 11 years.

Obligatory personal service thus extends for 20 years, and these twenty contingents are counted on in time to produce no less than 3,750,000 men. As this system was only introduced in 1872 it will take some years before it is fully developed.

The number of men annually attaining the legal age is about 312,000, of which 267,000 are retained on the lists. These are divided into two categories, one of 146,000 drafted for army service, and the other of 121,000 who are excused service with the colors, though 28,000 are posted to the auxiliary forces and the others remain liable to be called upon until they join the reserve after five years. Of the 146,000 drafted for army service, 92,000 serve with the colors, nominally for 5 years, though many are dismissed on furlough after 3 years. The remainder, numbering 54,000, serve with the colors a minimum period of six months which may be prolonged to one year, after which they join the reserve.

The reserve of the active army is liable to be called out for two trainings of 28 days each.

While in the territorial army, men are subject to periodical embodiments for drill and to an annual muster. Every man joins the territorial army at the age of 29.

The peace establishment of the army is 469,310 men, and 95,043 horses excluding the Gendarmerie and the Garde Republicaine. The war strength in 1879 was 1,809,000 men.

AN INFANTRY company on a peace footing musters only 75 rank and file, its war strength being 250. There are four companies to a battalion. A regiment consists of 4 battalions, with 2 depot companies in addition. There are 185 regiments or 654 battalions. The companies on a peace footing are dangerously weak and on mobilization would be swamped by reservists.

A CAVALRY regiment consists of 5 squadrons each having about 140 troopers. There are 71 regiments exclusive of 7 in Algeria. One Cavalry Brigade of two regiments belongs to each of the 18 corps d'armées. the rest form brigades and divisions of independent cavalry.

THE ARTILLERY consists of 19 brigades of two regiments each with a total of 432 batteries. One regiment of each brigade has 8 field

batteries, 2 depot field batteries, and 3 garrison batteries, the other regiment has 8 field, 3 horse and 2 depot field batteries. Each battery has 6 guns.

Each Army Corps comprises 2 Infantry Divisions each of two regiments, 1 battalion Chasseurs, 1 Cavalry Brigade, 1 Artillery Brigade, 1 battalion Engineers, 1 squadron military train, and 1 company volunteer scouts. A Division of Infantry consists of 2 brigades each of 2 regiments.

Organization of the Austrian Army

The forces of the Empire consist of:

(1). Active Army. (2). Reserve. (3). Landwehr. (4). Ersatz Reserve. (5). Landsturm.

PERIOD OF SERVICE.—In the ranks 3 years.

“ reserve 7 “

“ Landwehr 2 “

—
Total . . . 12 years.

The war establishment of the army and its reserve is fixed at 788,000, and this basis controls everything. The peace establishment is 252,000. These are supplied by an annual contingent of about 95,000 men (334,000 becoming annually liable to serve) 54,000 being supplied by Austria and 41,000 by Hungary. Besides these, about 10,000 men are taken annually for the Ersatz reserve to keep it at a strength of 97,000 men. The Ersatz reserve receive no training but may be called up for 2 years into army service and pass into the Landwehr after 10 years.

Men not drawn for the active army or Ersatz reserve pass at once into the Landwehr. There are also 3 year and 1 year volunteers. The Landwehr is thus composed of 3 contingents of trained soldiers, 10 of Ersatz men and 12 of men who entered the Landwehr direct. The Landwehr men who have not served in the ranks receive 8 weeks' training on joining and subsequently 2 or 3 weeks annually. There are two Landwehr battalions per regiment of regular infantry. The Landsturm is a purely voluntary force at the call of the Emperor, they elect their own officers, wear no uniform but only a distinctive badge.

The Empire contains 16 military districts each containing from 1 to 4 divisions. There is no army corps organization but the military unit in time of peace is a Division. There are 36 Divisions which in time of war would form 13 corps d'armées.

AN INFANTRY REGIMENT is composed of 6 battalions, 3 being field battalions, 2 reserve battalions each of 4 companies, and 1 depot battalion which in peace time consists of only 21 persons. The field battalions change their station as required. In war time the depot battalion is expanded into a third reserve battalion. On mobiliza-

tion a battalion is about 1,000 strong, and a regiment 6,000. The reserve battalions form a reserve regiment. There are altogether 95 regiments of infantry.

A CAVALRY REGIMENT consists of 6 squadrons and 1 depot squadron, each of 150 horses always on a war footing. There are 44 regiments organized into cavalry brigades.

ARTILLERY.—There are 13 regiments of field artillery and 12 battalions of garrison artillery. A regiment of field artillery has 12 batteries,—3 horse, and 9 field, and in addition two depot batteries. Each battery has 8 guns in time of war and 4 in peace.

On mobilization 13 corps d'armées and 5 independent cavalry divisions would be formed. An army corps would consist of 3 divisions of infantry, 1 regiment artillery, 1 brigade of cavalry and 1 company engineers, numbering approximately 50,000.

A Division consists of 2 infantry brigades, 2 battalions rifles, 2 to 4 squadrons cavalry, 3 batteries artillery, 1 company engineers, etc., total about 15,000 men.

An Infantry Brigade is composed of 2 regiments.

Organization of the Russian Army.

The Empire is divided into 14 military districts and 250 recruiting districts, exclusive of the province of the Don Cossacks.

The law of 1874 on which the Russian military system is based enforces universal liability to serve from the age of 20.

The forces consist of:

1st, The regular army.

2nd, The reserve.

3rd, The Imperial militia.

PERIOD OF SERVICE.—In the regular army 6 years.
“ “ reserve 9 “

—
Total . . . 15 years.

All men not called into the ranks belong to the militia from 20 to 40 years of age. The militia is divided into two parts, the first and second bands, and in 1878 numbered 970,000. The 1st Band consists of the 4 junior contingents and is liable to fill deficiencies in the army.

Service in the ranks is shortened by sending men on furlough. Men of the reserve are called up by Imperial decree and are liable to 2 manœuvres of not over 6 weeks each. In time of war the limit as to liability of service ceases so that a man could not then claim his discharge. There are the usual provisions for shortening the term of service for the educated classes.

The regular troops are divided into the active army, local, and reserve troops.

In the active army there are 192 regiments of infantry of 516 battalions and 32 rifle battalions. Each battalion of infantry has 4 companies and one rifle company. Peace strength 500, war establishment 900.

THE CAVALRY contains 56 regiments of 4 squadrons each, each squadron having 128 troopers who would be employed on service as corps cavalry. In addition to these there is the Cossack cavalry who would form the divisional cavalry.

FIELD ARTILLERY.--There are 173 batteries and 50 mitrailleuses batteries. Each battery has 8 guns.

The ordinary war establishment of the regular army including Cossack troops numbers about 1,111,000 divided into 843,500 infantry, 88,400 cavalry, 149,800 artillery, and 29,800 engineers. Of these the field force numbers about 724,000. The peace establishment of the active army is about 458,000.

The local troops numbering about 250,000 comprise those only partially fit for the field, and are reserved for duty in fortresses, etc.

The reserve troops are entirely employed in training recruits.

In 15 years' time from 1874, Russia expects to have nearly 3 millions of trained men available for active service, deducting casualties and exclusive of the militia. Taking the annual contingent at 220,000 men (in 1880 235,000 men were taken) the forces would be as follows:

Six contingents active army..	1,320,000.
Permanent force of the army	140,000, N.C. officers, etc.
Nine contingents of the reserve	1,240,000.
Cossack troops.....	200,000, cavalry and infantry.
	2,900,000.

At the present time this force consists of 768 infantry battalions and 520 batteries,—exclusive of the army of the Caucasus.

The militia is estimated at another million and a half. The population of the whole Empire (Turkestan, Siberia, etc.) is 82 millions.

AN ARMY CORPS consists of two infantry divisions, 1 division of cavalry (of two brigades of two regiments),—besides artillery and engineers.

INFANTRY DIVISION.—Two brigades, and a brigade of artillery of from 4 to 6 batteries.

An Infantry Brigade consists of two regiments with 6 or 8 battalions according to the organization of the regiments.

Organization of the Italian Army.

By a law passed in 1875 it is intended to provide a force of over two millions of men. Obligation to military service commences at the age of 21 and lasts 19 years. Each annual contingent is divided into three categories, the first about 65,000 men, the second 52,000, the third 57,000, or in all 174,000 men.

The forces are divided into 3 classes :

1st, The permanent army including the reserve.

2nd, The Mobile Militia, a sort of second army of the active and reserve forces.

3rd, The Territorial militia.

(1). Liabilities of the men of the 1st Category :

In the ranks of Regular Army 3 years. } Cavalry 5 years.

“ “ Reserve..... 6 “ } “ 4 “

—
Total.... 9 years.

Mobile Militia..... 3 “

Territorial Militia..... 7 “

—
Total.... 19 years.

(2). Men of the 2nd Category form a recruiting reserve.

Borne with the regular army 5 years. } Held liable to fill vacan-

“ “ Mobile Militia 4 “ } cies in the regular army.

“ “ Territorial “ 10 “

(3). Men of the 3rd Category are such as are exempted from service for family reasons, except in time of war. They enter the territorial army direct and remain in it for 19 years.

Men of the 2nd Category are liable to 90 days drill on joining. No periodical training has been provided for, which is a great omission, but is done for economical reasons. Thus the men of the 2nd and 3rd Categories are practically untrained and in the event of mobilization will be mere raw levies.

The permanent army with its reserve and the Mobile Militia excluding officers numbers..... 704,000
Recruiting reserve..... 200,000
Territorial militia at present..... 580,000—in 1894 it should number 1,250,000 men.

There are the usual exemptions and one year volunteers.

The peace establishment of the army is about 220,000 men.

An Infantry Regiment on a war footing numbers 2,563 men and consists of 3 battalions.

A Brigade of Infantry consists of 2 regiments.

A Division,—2 brigades, 3 batteries, 2 squadrons of cavalry, etc.

Army Corps,—2 division of infantry, 1 regiment of rifles (4 battalions), 1 brigade cavalry (2 regiments or 8 squadrons), 1 artillery brigade (4 batteries), 2 companies engineers, etc.

Military Forces of the United States.

The Military forces of the United States consist at the present time of the Regular Army and the Militia of the different states.

REGULAR ARMY.

The regular army consists of:

25	Regiments of Infantry.
10	“ “ Cavalry.
5	“ “ Artillery.
1	Battalion “ Engineers.

The total number of enlisted men is not to exceed 25,000.

The army is provided with—a corps of Adjutant Generals; of InspectorGenerals; of Quartermasters; of Subsistence; of Engineers; of Ordnance; of Paymasters; a Medical Corps; a Chief Signal Officer; a Bureau of Military Justice; a number of Chaplains; a force of Indian Scouts; Officers on the retired list; and the Military Academy at West Point.

There are 11 General Officers, namely: 1 General, 1 Lieutenant General, 3 Major Generals and 6 Brigadier Generals. The ranks of General and Lieutenant General are to be abolished.

MILITIA.

The law requires the enrolment into the militia of all able-bodied men between the ages of 18 and 45 excepting those who are exempt by law.

The Militia of each State is required to be arranged into companies, battalions, regiments, brigades, and divisions, as the State Legislature may direct and it is liable to military duty and to serve a definite period. The officers are appointed by the State. This force may or may not be provided with a uniform, and except in special cases receives no pay.

In addition to the general militia there are in every State bodies of men who have voluntarily associated together for military purposes, who wear a uniform and frequently obtain some special privileges. Although militia they are distinguished from the general militia by the term *Volunteer*.

Congress is empowered to call out the militia for the purpose of enforcing the laws, suppressing insurrections and repelling invasions, and the President has also authority to call out the militia under certain exigencies.

When called out on actual service the militia receive pay and are subject to the Rules and Articles of War.

Besides the militia formed into volunteer companies mentioned above, there is another class of troops known as *Volunteers*. They are raised by Congress and employed by government when a sudden emergency arises.

When sudden emergency demands Congress empowers the President to call for volunteers, limiting their number and defining the proportions of the different arms of the service. As a rule the numbers required are proportioned among the States according to their population,—and companies, battalions and regiments are formed in each State and officered by the Governor of the State acting under Congress:

The United States army may therefore be said to be composed as follows :

1st, **THE REGULAR ARMY**, whose commissioned officers hold commissions for an indefinite period and whose N. C. officers and privates enlist or engage to serve the United States for a definite period.

2nd, **VOLUNTEERS**, whose commissioned officers, N. C. officers and privates have volunteered to serve for a definite period.

3rd, **THE PAID MILITIA**, whose officers, N. C. officers and privates are enrolled according to law and are subject to military duty for a definite period.

Thus the regular army and the volunteers serve voluntarily, and the militia, if called out, are obliged to serve.

The strength of the organized militia is 8,869 commissioned officers and 117,037 N. C. officers and men.

The unorganized force, or the number of men available for military duty in the United States, is put down as 6,516,758.

In the United States the absolute necessity for having a body of properly trained officers is fully recognized and the Military Academy at West Point was formed in 1802 for the instruction of officers. The mode of admission into the Academy is by nomination and by passing a qualifying examination. The age of admission is between 17 and 22, the course lasts 4 years, the Cadets are under Military Law, have to take an oath of allegiance on entering, and are tried by Court Martial for serious offences. There are generally about 250 Cadets at the Academy with 50 officers and professors.

Discipline is very strict and dismissal by no means infrequent. The course of study pursued is so severe that the proportion of Cadets in past years who have failed to qualify at the examinations and who have consequently been dismissed is nearly one-half. There is no regular long vacation, but during the months of July and August, when studies are suspended, the cadets are under canvas

when the discipline is exactly similar to that of soldiers only somewhat more strict.

Many Cadets who have graduated receive commissions and enter the army. The senior Cadets who chose the Engineer Service have a further technical course to undergo at Long Island, and those who enter the Artillery a course at Fortress Munroe,—while those posted to the Cavalry and Infantry join their regiments at once. Those who do not enter the army revert to civil life.

The Canadian Militia.

In 1862 a commission on the Canadian militia recommended, in their report, that the strength of the active force should be 50,000, adding that, even with that number it would be necessary, in case of an invasion, to supplement it with a strong body of regular troops and a powerful fleet of gunboats on the lakes. They further recommended that the country should be divided into Military Districts which should comprise Regimental Divisions; that a permanent District and Regimental head-quarter staff should be maintained; and that the annual period of training should be 28 days.

For reasons of economy this plan was rejected by the House of Assembly, and in 1863 a Militia Bill of quite a different nature was passed. In 1868 on the Confederation of the Dominion, this act was repealed and the present Militia Act passed. Under the latter the whole male population between the ages of 18 and 60, who are British subjects and not otherwise disqualified, or exempted by law, are enrolled, but Her Majesty may require all the male inhabitants of the Dominion, capable of bearing arms, to serve in case of a *levée en masse*.

The force is divided into the following 4 classes arranged in the order in which they are liable to be called upon to serve:—

- (1). Unmarried men, or widowers without children between the ages of 18 and 30.
- (2). Unmarried men, or widowers without children up to 45.
- (3). Married men, or widowers with children from 18 to 45.
- (4). The enrolled population from 45 to 60.

The Militia is divided into Active and Reserve Militia. The Active Militia consists of the Volunteer Militia, Regular Militia, and Marine Militia.

The Volunteer Militia which is limited to 45,000 is raised by voluntary enlistment. A few years ago this force was, for reasons of economy, reduced to 37,000 by reducing each company from 54 men to 42. Men, in the Volunteer Militia are, in time of peace, engaged for 3 years, but they can leave on giving six months' notice.

THE REGULAR MILITIA is composed of men voluntarily enlisted, or of men balloted to serve, or of both.

THE MARINE MILITIA is similar to the Regular Militia only it is composed, as its name implies, of seamen, sailors, etc., employed in navigating the waters of the Dominion.

The period of service in the regular and marine militia is two years in time of peace.

The volunteer militiamen who have served 3 years, or the regular and marine militiamen who have been enrolled for drill and training during two years in any service company, are not liable to be again called out for drill and training until all the other men in the first, second and third classes in the same company division have volunteered or been balloted to serve.

THE RESERVE MILITIA consists of the whole of the men who are not serving in the Active Militia. They are divided into the 3 classes, between the ages of 18 and 60 years. About 655,000 men are liable by law. This force has not been mustered since 1873.

Power is given to the Governor General in Council to enforce the ballot to fill up the ranks of the Active and Reserve Militia; but this has not yet been resorted to. Men balloted may become exempt on providing a substitute and paying \$30 to the Captain of the Company Division, which sum is paid to the substitute. Should the substitute become liable to serve his place must be supplied by the person in whose stead he is serving. The command of the whole force is vested in the Queen and through her in the Governor General. He is advised in all matters relating to the militia by the Minister of Militia and Defence, who is charged with, and is responsible for, the Civil Administration of Militia affairs, including all matters involving military expenditure such as pay, fortifications, armaments, gunboats, equipment, clothing, etc.

The whole force is commanded by a General Officer of the Army assisted by the Adjutant General of Militia who has the rank of Colonel.

The Dominion is divided into 12 Military Districts, viz: 4 in Ontario, 3 in Quebec, 1 in New Brunswick, 1 in Nova Scotia, 1 in Prince Edward Island, 1 in Manitoba and 1 in British Columbia; each is commanded by a Deputy Adjutant General who has the rank of a Lieutenant Colonel and is in most districts assisted by a Brigade Major.

Each Military District is divided into several Regimental Divisions which are again sub-divided into Company Divisions. For each Regimental Division one Lieutenant Colonel and two Majors of Reserve Militia are appointed, generally from the residents in that Division; similarly, for each Company District are appointed one Captain and two Subalterns of Reserve Militia. The enrolment of the militia is made in each Company Division by the Captain

(assisted by his junior officers and N. C. officers), who is liable to have to furnish a roll of the names of all the men in the different classes resident in his division specifying those who are Volunteer Militia, those who have completed their service in the Militia, and those who belong to the Marine Militia.

When a man is enrolled the oath of allegiance to Her Majesty is administered by the commanding officer of the corps, he having previously taken the oath before a Justice of the Peace.

Persons exempt from enrolment are :

Judges, clergy, professors of colleges, officials of the penitentiaries and asylums, men disabled by bodily infirmity, and the only son of a widow being her only support.

The following, although enrolled, are exempt except in cases of war, invasion, or insurrection :

Half pay and retired officers of the British army and navy, seafaring men and sailors employed in their calling, pilots during the season of navigation, masters of public and common schools engaged in teaching, persons who are averse to bearing arms owing to their religious opinions subject to certain conditions.

The active militia are liable to an annual training, not to exceed 40,000 men, in time of peace for not more than 16 or less than 8 days. In 1879 only 19,780 men of the Volunteer Militia were trained for 12 days.

The following is the strength of the actual militia :

Cavalry	1,803
Field Artillery.....	1,326
Garrison Artillery.....	3,048
Engineers.....	232
Infantry	27,320
Total.....	33,729

There are 18 field batteries armed as follows :

15 with 9 Pr. M.L.R. Guns.

1 with 6 Pr. B.L.R.

2 with bronze smooth bores.

There are in addition two schools of gunnery, the men being permanently enlisted, at Quebec and Kingston respectively, armed each with four 9 Pr. M.L.R. Guns.

The infantry of the militia is armed with the Snider rifle.

For purposes of instruction of officers schools of military instruction are established. In addition Cadet companies are formed in the universities, high schools, and colleges of the Dominion, who are instructed

ted in drill, but are not to be employed on active service. Snider rifles are issued to Cadet companies exceeding 40 lads over 14 years of age.

LIABILITIES.—The Active Militia are liable to be called out on active service in aid of the civil power in any case of actual or anticipated riot, disturbance of the peace or other emergency, either within or without the municipality in which the corps is raised, by the senior officer of the Active Militia present when required in writing by the chairman of the quarter sessions of the peace, or by any three magistrates, of whom the Mayor or other head of the municipality may be one.

The officer commanding any military district, or the commanding officer of a corps of active militia, may, upon any sudden emergency of invasion or insurrection, call out the whole, or any part, of the militia under his command. As a rule, however, the active militia would be called out by the Governor General in Council, and in case of war may have to serve either within or without the Dominion, and when called out they may be placed under the orders of the officer commanding the regular forces in Canada, and may be required to serve continuously for not more than 18 months.

The Active Militia are subject to the Queen's Regulations, and, when out for drill or on service, or when dressed in uniform are under the Army Discipline Act.

Absence without leave for over 7 days, when called out for actual service constitutes desertion.

Officers, N. C. officers and men are liable to be fined or in default imprisoned for various offences, such as refusing to attend drill, disobedience of the order of a superior, etc., if convicted by a magistrate.

RATES OF PAY.—When called out in aid of the civil power, officers obtain the same pay as in the corresponding ranks of Her Majesty's service, two dollars a day additional if mounted. N. C. officers and men one dollar,—and one dollar for each horse. Pay and lodging to be furnished by the municipality.

When embodied for annual drill all ranks receive 50 cents a day and 75 cents for each horse.

When on active service the militia are paid at the same rate as in Her Majesty's service, or such rate as may be fixed at the time.

Officers provide their own uniform, arms and accoutrements. Corps of organized militia are supplied with clothing which has to last 5 years, and with arms and accoutrements.

At Kingston a military college, known as the "Royal Military College of Canada," has been established,—the object of this institution is best expressed by extracts from the Act establishing it :

An Institution shall be established for the purpose of imparting a complete education in all branches of military tactics, fortification, engineering, and general scientific knowledge in subjects connected with, and necessary to, a thorough knowledge of the military profession, and for qualifying officers for command and for staff appointment.

Admission to the College is obtained by open competitive examination held once a year, a fixed number of vacancies being allotted to each of the twelve military districts into which Canada is divided. Should a district not present any candidates for the examination, then its quota of vacancies are open for competition by candidates from the remainder of the Dominion. Cadets must be in future between the ages of 16 and 18 at the time of their admission.

The course of instruction extends over a period of four years, for which term of service the Cadets are regularly enlisted soldiers and subject to the Army Discipline Act, Queen's Regulations and the Regulations for the Militia of Canada.

The Cadets are organized as a Cadre battalion under officers and N. C. officers to each company. They wear uniform at all times, and are armed and fully equipped in every minute detail as infantry. The discipline, routine, punishments, etc., are strictly military, in fact they are in all respects efficient soldiers.

The theoretical course of instruction embraces mathematics, fortification, geometrical drawing and descriptive geometry, theory and construction of artillery, military topography and reconnaissance, strategy, tactics, military administration and law, French, German, physics, chemistry, geology, freehand drawing and painting, civil engineering, surveying and architecture.

The practical course includes infantry, artillery, and engineer drills and exercises, equitation, gymnastics and swimming.

Cadets who graduate receive one of two classes of certificates. Cadets who obtain 1st Class certificates are eligible for employment on the staff and in the artillery and engineers, those who obtain 2d Class certificates are eligible for cavalry and infantry.

The position of the Cadets in graduating is determined by the aggregate number of marks obtained for theoretical and practical subjects of instruction as well as for conduct and discipline from date of entering to date of leaving the R. M. College. For any subject in which a Cadet has obtained very marked proficiency the terms "Honours" or "Special Mention" are recorded on the certificates.

The standard of the actual education represented by 1st Class certificates is about the same as that required for commissions in the Royal Artillery and Royal Engineers from Cadets of the R. M. Academy, Woolwich, and that represented by 2nd Class certificates

the same as that required for commissions in the cavalry and infantry from Cadets of the R. M. College, Sandhurst, and is fully equal to that required at the United States Military Academy at West Point, or at the Military Colleges of any of the nations on the European continent.

As it is not probable that all the Cadets of the R. M. College of Canada will obtain, or desire, military employment, the curriculum of the College is so adapted as to fit a graduate for civil employment, especially for public works and civil engineering generally.

The military education, routine work, and training, is of a more strict and practical nature than at the British Military Colleges, and the Canadian Cadet has in turn to go through the same military duties as are performed by a private soldier, N. C. officer and officer. It is necessary for the Cadets of Canada to learn, whilst at the College, in order afterwards to impart their knowledge to the militia, much which an English Cadet is able to learn after he has obtained his commission in the Royal Army, and for this reason the Canadian Cadet is necessarily instructed in the duties and exercises of all branches of the service.

Organization of the Military Force of Switzerland.

It may be useful to compare the organization and training of the Canadian militia with the sole military force of Switzerland.

By the constitution of that country it is forbidden to keep a standing army; consequently, the whole force is raised and organized as militia. Every citizen is required to bear arms; children even are instructed in military exercises at school.

Population about $2\frac{1}{2}$ millions.

The militia is divided into 3 classes:

(1). The Federal army, composed of all men between the ages of 20 and 30; number, about 3 per cent. of the population.

(2). Army of reserve, consisting of all who have served in the 1st Class, and who are between 31 and 40 years of age; number, about $1\frac{1}{2}$ per cent. of the population.

(3). The Landwehr, in which all men who have passed through the first two classes, and others, are enrolled till 44 years of age, when liability to military service ceases.

Total of whole force, about 202,477 men; of which 174,000 are infantry, 4,500 cavalry, and 18,255 artillery; the remainder being engineers and administrative troops. Of the above 99,000 belong to the Landwehr.

The training of all recruits in the Federal army lasts from 6 to 9 weeks, according to the branch of the service, and then for 16 days every alternate year for from 8 to 10 years except the cavalry who have an annual training.

The officers required for this force, numbering over 7,000, are all trained at military schools, and there are other schools for the N. C. officers. This is a very important feature in the Swiss militia, as it is universally admitted by all nations, that in these days, more than ever before, carefully trained officers are essential, and that with troops, like militia,—which can only be partially drilled, and must necessarily be more or less deficient in organization, cohesion and discipline,—as large a proportion as possible of specially trained and disciplined officers are even more absolutely indispensable than with permanently embodied regular troops. The Swiss government is so alive to the necessity of education that no less than one-fourteenth of the whole military expenditure is devoted to educational purposes.

It is moreover considered desirable to have a regular military course of instruction at the "Ecole Polytechnique," a school intended for the education of all Swiss citizens. To carry out this instruction there is a special Military Section, the expense of which is borne by the State, to which military officers are appointed professors for instruction in military history (strategy and tactics), military organization and administration, the study of arms, the theory of shooting, and fortification.

Appointment and Promotion of Officers in Different Armies.

GREAT BRITAIN.—Commissions in the army are obtained almost entirely by competitive examinations into the the two Military Colleges:—The R. M. College, Sandhurst, for the cavalry and infantry, and the R. M. Academy, Woolwich, for the artillery and engineers. Subject to certain regulations commissions are also given to Cadets of the R. M. College of Canada who are reported duly qualified.

For the R. M. College candidates must be between the ages of 17 and 21, and for the R. M. Academy between 16 and 18, and the number of Cadets admitted bi-annually varies according to the requirements of the service. The course of study prescribed at these Colleges must be pursued by all candidates for commissions in the army, except lieutenants of militia, and N.C. officers promoted. The course at Sandhurst is for one year and at Woolwich for 2½ years.

Besides the Cadets admitted into the R. M. College by open competition there are a few who are admitted on passing a mere qualifying examination, these are:—

1. Queen's Cadets, or sons of officers of the army, navy and marines, who have fallen in battle, died of wounds, or of disease contracted in the service abroad, and whose families are left in reduced circumstances. The Cadets are appointed by the Secretary of State on the recommendation of the Commander-in-Chief, or First Lord of the Admiralty.

2. Honorary Queen's Cadets, or sons of officers killed in action, or who have died of wounds within 6 months of the time they were

received, or who have died of disease contracted in the field in the presence of the enemy within 6 months from the time the illness was contracted.

3. Indian Cadets, or sons of officers of the Indian military and civil service who are nominated by the Secretary of State for India in Council.

Promotion in the army is by seniority tempered by selection, and all officers have to pass a professional examination up to the rank of field officer inclusive. The Commander-in-Chief has the power to select 4 officers annually for promotion whose special services seem to make such promotion desirable. For service in the field, or for any other important services, officers above the rank of lieutenant may be promoted to brevet rank, that is, superior rank in the army while retaining their proper rank in their respective regiments; in special cases officers receive promotion into other regiments.

To educate officers for employment on the staff there is a Staff College, the entrance into which is by competitive examination among such officers as desire to compete and are recommended by their commanding officer, but out of the 20 candidates allowed in annually only 3 can belong to the artillery and 2 to the engineers. The course of study lasts two years and officers on joining must have at least 5 years' service. Confidential reports as to the qualifications of each officer for staff employment are forwarded by the Commandant to the Commander-in-Chief. Officers appointed to the staff are, however, not always selected from among those who have passed through this College and been recommended. The period of staff service is restricted to 5 years, after which officers return to their regiments, but they may be re-appointed or obtain other staff employment.

GERMANY.—In the German army the rank of officer can only be reached after a previous service of six months as "portépeé-fæhnrich," except by a very few of the most meritorious Cadets, called "Selecta," who are commissioned as officers on graduating from the Cadet school at Berlin.

The rank of portépeé-fæhnrich is reached in two ways, either as an "avantageur" through the regiment, or as a pupil coming from a Cadet school. A candidate for a commission without going through a Cadet school, presents himself to the colonel of a regiment, and if accepted by him, he enters the regiment as an "avantageur" serving 6 months in the ranks, at the end of which time he may be raised to the rank of portépeé-fæhnrich, if he has passed an examination in a school fitting him to enter a university and by passing what is called the "Fæhnrich's Examination."

The principal, though not the only object, of the seven Cadet schools in Germany is to furnish candidates for the rank of officer :

the seventh school called the "Higher Cadet School" at Berlin gives higher education to pupils from the other six schools. The Cadets who have passed the course of the first class at the Higher Cadet School, are admitted to the same examination as the *avantages* competing for the rank of *portépeé*. Those who become qualified have first to serve 6 months in the ranks.

No *portépeé-fähnrich* can reach the rank of officer without obtaining admission by the corps of officers and obtaining a certificate on passing out of a war school of which there are seven, the course being entirely military and lasting 10 months. At the end of the course the pupils pass the officer's examination and then return to their regiments when they obtain the rank of officer by seniority, if approved by the corps of officers. On thus becoming officers of the army, those who wish to serve in the artillery or engineers have to spend the former 11 months and the latter 22 months, at the special Artillery and Engineer Schools at Berlin.

The German system thus differs from that of most of the other powers in two main respects; in the latter officers of all arms are for the most part commissioned directly upon graduating from the different military schools, and officers for the artillery and engineers are kept distinct from the cavalry and infantry, while in Germany a certain time has first to be passed in the ranks, and officers for all branches are all drawn from the same service, and their general instruction is nearly uniform.

Promotion is almost exclusively by seniority, yet the Emperor as the head of the army, has the right, which is at times exercised, of promoting able junior officers. In order that the other less able officers may not appear to be passed over, which would morally oblige them to retire into civil life, such senior officers are sometimes given the designation of the superior rank and they are then as far as possible employed on special duties, or the junior officer is promoted into some other corps, etc. Except for the promotion of artillery and engineer officers to the rank of captain officers have to pass no examination for promotion.

For the ranks of 1st lieutenant and captain, promotion goes in each corps, except in the engineers where it goes in the whole arm. For the rank of major in the infantry promotion goes in the regiment (with exceptions), in the other arms it goes in the whole arm. Promotion goes in the arm for the ranks of lieutenant-colonel and colonel, and in all the arms combined for the ranks of general officers.

Officers in Germany have no legal status and promotion is entirely at the discretion of the head of the army though promotion by seniority is the rule. The Emperor favours officers by passing them into corps where promotion is rapid, by antedating their com-

missions, or by making them supernumeraries,—a system, which may be good when used, as it doubtless has been in Germany, for the good of the service, but one, which in some countries, would lead to favouritism of the worst kind and would tend to sap the spirit of discipline among the whole body of officers.

Appointments to the staff are given to those officers who have graduated at the War Academy at Berlin, admission to which is by competitive examination, and the course of study lasts 3 years. High commands in the army are also given almost exclusively to those who have passed with success through the War Academy. Staff officers, before each promotion, are required to return to regimental duty to keep them in sympathy with the troops, and the seniors have to hold for a year a command corresponding to their rank.

FRANCE.—In France there are two great military schools, as in England, entrance to which is by competitive examination :—St. Cyr being for infantry, cavalry and marines, and the Polytechnique for artillery and engineers, military and naval. The course of study in both is for two years. At the conclusion of the course at the Polytechnique those graduates who are assigned to the artillery and engineers are commissioned second-lieutenants and sent to the School of Application for a further term of two years.

Until quite recently officers after passing through the Staff School were appointed permanently to the staff,—now, however, an Academy of War similar to that at Berlin has been established and appointments to the staff are for limited periods (4 years).

Promotion is partly by seniority and partly by selection.

AUSTRO-HUNGARY.—Officers in the Austrian army are supplied either by students passing out of the War schools, or by Cadets who have served at least one year, and who have, besides a practical knowledge of the service, the qualifications and social education necessary for the rank of officer.

There are two Military Academies, one for the artillery and engineers and one for the other branches, in all of which the course of study lasts 4 years. Each has attached to it a preparatory school which furnish the majority of their pupils. There are also Schools of Application for artillery and engineer officers after they have been at least two years in the service.

The title of Cadet is conferred by the War Minister on all N.C. officers and men who pass a prescribed examination. All who obtain it are qualified to become officers,—but they have to be selected by the corps of officers.

Promotion is by seniority, though the Emperor reserves to himself the right to advance by selection those who have performed distinguished service in peace time as well as in war, and officers who have not the necessary qualifications are debarred from further promotion.

For certain steps examinations have to be passed, except for the artillery and engineers who have passed with success through the Schools of Application and for those officers who have passed through the War School. Up to the rank of colonel promotion mostly runs in the arm; superior officers are placed on one list for promotion.

Officers who have served at least 3 years and are recommended may compete for admission to the War School to qualify themselves for high command and also for staff employment. At this school the course of study lasts 2 years.

RUSSIA.—The largest portion of officers is composed of N. C. officers, promoted after pursuing a special course of education at what is called a Junker's School for two years. There are 12 of these schools for the infantry, two for cavalry and two for Cossacks.

There are besides the usual Military Schools for Cadets, three infantry and one cavalry school in which the course is for two years, also one artillery and one engineers' school where the course is for 3 years.

There is also a school of the Emperor's pages, for children of parents who have rendered distinguished service to the State, length of course 7 years; the pupils on leaving usually pass into the guard.

Promotion for subaltern officers runs regimentally,—to the rank of major it generally runs in the Division for Infantry and Cavalry. Promotion above the rank of major goes in each arm, and that for general officers goes in the whole army. Promotion to the rank of captain is, with rare exceptions, by seniority in the Division; that to the rank of major is by seniority or selection, though the latter predominates, promotion above the rank of major is entirely by selection.

To qualify for the staff, officers pass through a War Academy. They must have had 4 years' service and the course lasts two years. Up to the rank of captain officers of the staff receive promotion every two years. A captain after 3 years in his rank is promoted to the rank of lieutenant-colonel, missing that of major. Promotion in the staff is thus exceptionally rapid, the object being to enable highly educated officers to arrive at the grade of general while still in full mental and bodily vigour.

ITALY.—The first rank of officer is filled either by Cadets from Military Schools or from among N. C. officers promoted.

There is one Military Academy for artillery and engineers, and a Military School for cavalry and infantry,—entrance to which is by competition and the course lasts 3 years, there is also a preparatory military college to train those who wish to enter the Military Schools. There is a School of Application for artillery and engineers, the course lasting two years, and also a school for N. C. officers, admittance to which is by competition and the course lasts two years.

On leaving this school their names are put on a roster for promotion to the rank of sub-lieutenant. There are also to be two similar schools for N. C. officers of the artillery and engineers. One-third of the vacancies are allotted to N. C. officers and two-thirds to the schools.

Promotion up to the rank of general officer runs in the arm and then in the whole army. Promotion is partly by seniority and partly by selection according to a prescribed scale for each rank, the proportion being different in time of peace, when there are fewer promotions by selection than in war time. For instance, in peace time the promotion of captains to the rank of major is half by seniority and half by selection, in war time it is entirely by selection. Above the rank of major promotion is always by selection.

There is a War School to train officers for the staff, admission being by competitive examination for the cavalry and infantry and without examination for artillery and engineers who have finished their prescribed courses.

CHAPTER VIII.

ORGANIZATION and DISTRIBUTION of the STAFF.

The British Army.

To commence from the fountain head, the Sovereign is the head of the British army, and controls it through his Ministers of State and is advised by the responsible Minister. This has been the constitutional doctrine, developed at the time of the Revolution, and applied to the whole administration of the country as well as to the army.

After the abdication of James II in 1688 it was found necessary to fix a constitutional basis on which the army should stand with reference to the Crown and Parliament.

This was effected by three separate measures :

1st, By laying down certain fundamental principles as to the status of the army by the Bill of Rights and Act of Settlement.

2nd, By placing the pay of the army under the control of Parliament.

3rd, By granting to the Crown *Statutory*, in contradistinction to *Prerogative*, powers for the government and discipline of the army,—which power was granted by the passing of the first Mutiny Act in 1689.

These three measures fixed a constitutional basis on which the army should stand, and formed the starting point of the present status of the army. At the present day the Army Discipline Act contains the preamble of the Bill of Rights to the effect that,—the raising or keeping of a standing army, unless it be by sanction of Parliament, is unlawful,—and the passing of this act annually by Parliament therefore sanctions the maintenance of the army, the numbers of which are also clearly laid down in the act; and further, Parliament by its annual vote in supply sanctions the expenditure necessary for the maintenance of the army. Thus the Sovereign beyond all doubt commands the army, the maintenance and number of which is provided by Parliament.

Prior to the year 1854 the administration of the army was conducted by a number of departments all independent of, and more

or less clashing with each other, viz : The Commissariat, Barrack, Military Store, Purveyor's, and Transport Departments.

The heads of all these departments were :

1st, The Secretary at War, a Parliamentary representative for the purpose of financial matters only, and his functions did not embrace any affairs connected with the Ordnance Corps (artillery and engineers).

2nd, The Commander-in-Chief who was responsible *direct* to the Crown *alone* for all matters connected with the discipline, command, patronage, etc., of the army. His authority did not, however, extend to the Ordnance Corps.

3rd, The Master General of Ordnance, an officer of high standing and a Cabinet Minister, who was responsible to Parliament and independent of the Secretary at War and Commander-in-Chief. He held the command, discipline, and patronage of the Ordnance Corps and also controlled the following branches : custody and manufacture of all stores, contracts for supplies, fortifications, barracks, etc.

4th, The Commissariat was under the Treasury.

5th, The Militia was under the Home Secretary.

Thus there were five heads of departments independent of one another.

Out of this state of chaos arose the present system. In the year 1854 great changes were made. The office of the Secretary of State *for* War was created. He was made responsible to Parliament for the advice he gave to the Crown and for his other acts, and placed on the same footing as any other Secretary of State.

The office of Secretary at War was merged into that of the Secretary of State for War, and the Commissariat Department was transferred from the Treasury and placed under his control. In 1855 he received a patent investing in him the administration of the Army and Ordnance Department and therefore of all the departments controlled by the latter except in so far as referred to the discipline and military command of the army. These combined departments are known as the War Department. At the same time the command, discipline, and patronage of the Ordnance Corps were transferred to the Commander-in-Chief.—Hence, for administration, the Secretary of State for War was head over all the departments of the army, and for command the Commander-in-Chief. In 1868 the Control Department was instituted under a Controller-in-Chief to supervise and direct the five departments already named, viz : the Commissariat, Barrack, Military Store, Purveyor's and Transport Departments. In the same year an Inspector General of Reserve Forces was appointed to supervise the militia, yeomanry, volunteers, pensioners and army reserve.

The War Office Act of 1870 and the orders in Council issued in accordance with that act define positively the duties of the different functionaries connected with the army.

The Secretary of State for War assisted by a Parliamentary, and a Permanent, Under Secretary of State has immediate control of every branch of army administration.

The actual administration under him is divided into three principal offices :

1. The Military Branch under the Commander-in-Chief.
2. The Ordnance Branch under the Surveyor General of the Ordnance.
3. The Financial Branch under the Financial Secretary.

Their several duties are as follows :

1. The Commander-in-Chief is charged with the recruiting, training, discipline, distribution, and command of the personnel of the entire army both combatant and non-combatant.

2. The Surveyor General of the Ordnance is charged with the supply of all kinds of warlike as well as other military stores and supplies, also with transport and quarters.

3. The Financial Secretary is charged with pay and the audit of accounts.

In addition to the above three great departments there are some minor departments at the War Office which do not quite belong to either. For instance, there is the great Central Department which sorts and takes care of all correspondence, etc. Also the Works Division under the Inspector General of Fortification, which deals with the construction, repair, etc., of fortifications and barracks. The Medical Division which is a separate offshoot, also the Chaplain's Division, etc.

The above three great departments are sub-divided into minor ones as follows :

- 1st, The office of the Commander-in-Chief is sub-divided into the following divisions :

- a.* Adjutant-General's Division, sub-divided into infantry, cavalry, artillery, and engineer departments.

- b.* Quarter Master General's Division, which includes the Intelligence Department.

- c.* Military Secretary's Division.

- d.* Auxiliary Services.

- e.* Military Education.

The Adjutant-General's and Quarter Master General's Divisions are nominally amalgamated, but this is more nominal than real, the work of each being kept distinct although appointments to these offices contain the double designation.

2nd, The branch of the Surveyor General of the Ordnance has two principal divisions :—

- a. Director of Supplies and Transport.
- b. Director of Artillery and Stores.

Also minor divisions : (i) for contracts, and (ii) for clothing.

3rd, The Financial Department.

This branch manages the cash expenditure generally.

This same division of duties is found adhered to throughout the service and descends through all parts of the army. Every garrison, district, army, army corps, division, etc., has functionaries representing all these various branches, though of course on a minor scale. Often one representative of the staff has to perform the functions of several departments.

For instance, the Surveyor General of the Ordnance is represented by commissaries of the Commissariat and Transport Department and of the Ordnance Store Department. In some cases the Commissariat Officer also acts for the Financial Secretary.

The Staff of an army is generally classed into three heads :

1. Personal Staff, comprising military secretaries and aides-de-camp.
2. General Staff, comprising officers of the Adjutant-General's and Quarter Master General's Branches, including brigade majors who belong to the Adjutant-General's Branch.
3. Civil and Non-Combatant Staff.

At the first outset in organizing the staff of an army, a question of importance arises, whether there is to be a Chief of the Staff, and if so, what is to be the limit of his functions.

In England, where there is no recognized permanent office of Chief of the Staff, different views are held as to his duties. The most common view is that the Chief of the Staff should transact all business under the authority direct or implied of the Commander-in-Chief, and that he is to be the channel of communication between the Commander-in-Chief and all the military services, but excluding all civil and non-combatant services, such as medical, pay, chaplain's, etc. The Chief of the Staff then would be the head of the Adjutant-General's and Quarter Master General's Departments, and probably also of the Military Secretary's Department, though this is not clearly established.

Organization of the Staff of Different Units.

REGIMENTAL STAFF.—Each battalion of infantry and regiment of cavalry has an adjutant and quartermaster. The adjutant is one of the lieutenants but not attached to any company. The adjutant is the staff officer of the regiment.

BRIGADE STAFF.—A brigade, whether of cavalry or infantry, is commanded by a brigadier general or major general, who is allowed one A.D.C. Each brigade has a brigade major as its staff officer; he must be a regimental captain but ranks as senior to all other captains in the garrison.

The brigade major performs the same duties for the brigade as the adjutant does for the battalion. He issues and signs all orders, keeps a roster for all duties, all letters from the officers in the brigade to the general go through him, and he is responsible for the discipline and efficiency of the brigade. He has certain duties to perform at drill, and on the line of march his place is at the head of the brigade.

The artillery in each district is commanded by a colonel on the staff who has a brigade major as staff officer.

The head-quarters of each brigade of artillery are commanded by a Lieut.-Colonel, and the staff consists of an adjutant and quartermaster, the adjutant being a captain.

The engineer corps in each district is commanded by a colonel on the staff with an executive officer to assist him.

There is also a Garrison Instructor to each district ranking with a brigade major.

DIVISIONAL STAFF.—The staff of a division consists generally of:

- 1 Lieutenant General commanding.
 - 2 Aides-de-Camp.
 - 2 Officers designated Assistant Adjutant and Quarter Master Generals, though in reality their duties are distinct.
 - 1 D.A.A.G. 1 Subordinate to both their seniors and liable to
 - 1 D.A.Q.M.G. 1 work in either branch.
 - 1 Lieut.-Colonel R.A. } Each with an Adjutant.
 - 1 " R.E. }
 - 1 Assistant Commissary General of Commissariat.
 - 1 " " " of Ordnance, or some officer
- of that department of subordinate rank.
- 1 Assistant Provost Marshal.
 - 1 Principal Medical Officer.
 - 1 Staff Veterinary Surgeon.
 - 1 Senior Chaplain.

These comprise the actual staff which would march and encamp with the head-quarters of the division and form the right hand of the general.

The staff of an English district nearly corresponds to that of a division. A district is, however, usually commanded by a major general who has one A.D.C.

ARMY CORPS STAFF :—

- 1 General or Lieut.-General commanding, with 4 A.D.C.
2 Officers as Deputy A.G. and Q.M.G. } i.e., 6 officers in
2 Officers as Assistant A.G. and Q.M.G. } three grades of
2 Officers as Deputy Assistant A.G. and Q.M.G. } these
} departments.
1 Brigadier General R.A. with 1 Brigade Major and 1 A.D.C.
1 Colonel R.E. " " " "
1 Commandant at Head-Quarters.
1 Provost Marshal.
1 Deputy Commissary General of Commissariat.
1 " " " of Ordnance.
1 Principal Medical Officer.
1 Chief Staff Veterinary Surgeon.
1 Principal Chaplain.

The Commandant at head-quarters ranks generally with an Assistant Quarter Master General. His duties are to regulate everything connected with marching, encamping, quartering (billeting), baggage, police duties, and the general cleanliness and arrangements of the head-quarter camp. Everything within the radius of the head-quarter camp comes under his control. He commands all persons attached to the head-quarter camp, has a nominal roll of each person in that camp and all are attached to him for discipline and pay,—such as orderlies, escorts, officers' servants, etc.,—and every one coming to the head-quarter camp, even for a few hours must report themselves to him.

The Personal Staff comprises the Military Secretary and A.D.C.

As a rule, Military Secretaries, or Assistant Military Secretaries, are only allowed to general officers having independent commands. As a Military Secretary comes in contact with the civil branch of the staff he ought by his superior rank to have weight with these departments,—officers of the rank of colonel should, it is considered, be appointed as a rule.

A Military Secretary transacts for the General a class of correspondence which does not fall under the functions of the Adjutant-General's, Quarter Master General's, or Civil Branches, besides the

correspondence which relates to his branch, viz: Appointments, promotions, retirements, etc. He is also the General's confidential adviser.

At stations where there is no Military Secretary his correspondence generally passes through the Adjutant-General's branch.

Aides-de-camp are purely personal officials, they have no duties assigned to them by regulation, and the general is at liberty to employ them as he likes best.

The Prussian General Staff.

At Berlin there is a War Academy, the object of which is to educate officers for the staff and to hold high commands. The course lasts three years and one hundred officers pass out annually. Great stress is laid upon their proficiency in professional subjects such as tactics and strategy, also the general duties of the staff in reference to plans of campaigns, the movements of troops, the draughting of orders, etc. Military geography, relating to the lines of communication, strategic points, and lines of defence of various countries, is also carefully studied. The most proficient officers who have passed through the Academy are in time posted to the general staff at the War Office.

The general duties of the General Staff are to collect information regarding the organization, tactics, and armament of foreign armies, the present and projected lines of railway and other lines of communication in foreign countries, to prepare plans of campaign, and to arrange all the details for the mobilization, movements and concentration of troops in different theatres of war, either within the empire or abroad.

The duties are transacted in bureaux and sections as follows :

1. The Central Bureau, which is charged with all matters relating to the personnel of the staff, the survey, War Academy and the Railway Regiment.
2. The three sections and the Intelligence Bureau. The first section collects all information in reference to the organization, tactics, armament, and mobilization of the armies of Norway and Sweden, Russia, Austria, Denmark, Greece and Turkey. It likewise collects geographical information, and notes any changes in the fortifications and lines of communication in any of the above countries. The second section collects the same information in reference to Germany, Italy and Switzerland. The third section does the same in reference to France, England, Belgium, Holland, Spain, Portugal and America.

The information collected by these sections is procured from military attachés at foreign courts, and also by individual officers sent *incognito* to travel in the different countries.

The Intelligence Bureau collects and digests information prepared by these three sections and keeps always in readiness the most recent information relative to foreign armies, and probable theatres of war.

3. The Railway Section is charged with everything pertaining to the transport of troops and military stores by rail. The officers of this section work out all the details of moving troops by rail, the time required to transport them and the lines to be used in concentrating armies for war. To this end they are required to know the capacity of the different lines of railway both at home and abroad, and their strategic value.

The duties of this section are considered so important, in view of their influence in effecting the speedy concentration of armies, that all officers of the general staff are required to serve in it.

There is besides an accessory branch of the general staff charged mostly with scientific duties, the officers of which are not necessarily graduates of the War Academy.

This branch is divided into five sections as follows :

1. The Section of Military History which collects and arranges all information bearing on military history, and prepares descriptions of present and past campaigns.

2. The Geographical Statistical Section, collects all geographical and statistical knowledge relating to foreign countries, prepares reports showing their resources and corrects all military maps up to date.

3. The Trigonometrical Section which is charged with the triangulation of Prussia.

4. The Topographical Section, charged with the topographical survey of Prussia.

5. The Cartographical Section which prepares and corrects maps to date, and supplies maps to the army.

In order to preserve the habit of command, and keep staff officers in sympathy with the troops, they have in Germany, at stated times, to return and do duty with regiments. This principle is also considered advantageous in England where most staff appointments are for five years only.

The branch of the Quarter Master General's Department at the War Office in London known as the "Intelligence Branch" is charged with very much the same duties as those of the General Staff at Berlin, of which it is a model on a much smaller scale, and therefore need not be described. The chief difference is that, consequent on the number and importance of the colonies of Great Britain, there is a separate section called the Colonial Section, which is charged with

the collection of all necessary information relating to the different colonies.

On the outbreak of hostilities, the Intelligence Department is required to furnish all information respecting the enemy within its power, and if the war has been foreseen, officers should have been sent by that department to travel in the enemy's country to collect information ; this should, however, be done during peace as in Germany.

When the army takes the field it is of the utmost importance to obtain correct and constant information of the enemy's forces, movements, etc. This is done, partly by reconnaissances, but partly also by means of spies, intercepted letters, tapping telegraph wires, questioning inhabitants, etc. For carrying out these latter duties an officer is appointed to the General's staff as chief of the Intelligence Department, with subordinates when necessary, and others are employed with corps or divisions detached from head-quarters. Sometimes civilians having a knowledge of the language of the country and the customs, etc., of its inhabitants might be employed to help these officers.

CHAPTER IX.

CORRESPONDENCE and OFFICE WORK.

Generals on active service address despatches to the Secretary of State for War.

Correspondence at the War Office is divided into matter relating to the following divisions or departments :

1st, **ADJUTANT-GENERAL'S DEPARTMENT.**—This includes everything connected with the personnel, military duties, military operations as concerns the effective, discipline, and general efficiency of troops.

2nd, **QUARTER MASTER GENERAL'S DEPARTMENT.**—Strategical and topographical matters, movements and quartering of troops, barracks, canteens, recreation rooms, army signalling, cooking, etc.

3rd, **MILITARY SECRETARY.**—Admission to Military Colleges, appointments, promotions, exchanges, retirements, staff appointments, military honours and rewards, and reports as to qualifications of officers for promotion, etc.

4th, **EDUCATION BRANCH,** under the Director General of Military Education.—Examinations for promotion, garrison instruction, regimental libraries, schools, Military Colleges.

5th, **SURVEYOR GENERAL OF ORDNANCE.**—His correspondence divides itself into :—

(a) Director of Artillery and Stores,—all that relates to supply and equipment of every kind, and fixed armaments.

(b) Director of Supplies and Transport,—all relating to supply of food, forage, fuel and light, transport, custody of buildings in which troops are quartered, appropriation of quarters.

(c) Director of Clothing,—all relating to army clothing and necessities.

6th, **INSPECTOR GENERAL OF FORTIFICATIONS.**—All that concerns the construction, repair and alteration of fortifications, barracks and all military buildings, the charge and use of military lands and care of barracks, etc., *not* occupied by troops.

7th, FINANCE DEPARTMENT.—All matters connected with pay and military expenditure generally.

It is directed that the bulk of all correspondence should be treated locally by general officers and others in command without higher reference,—but the ultimate reference is to the above War Office Departments, and care must be taken to adhere strictly to the prescribed channel of communication. One very common fault in the British system is a tendency of individuals to avoid taking responsibility on themselves, and to refer matters for the decision of higher authority, on the plea that the superior might not be of the same opinion. This is a most pernicious custom and one which on active service is sure to lead to disastrous results. Every officer is bound to accept the responsibility of his office, one of which is the risk of committing an error, and of being found fault with by his superior. Any officer who avoids taking on himself reasonable and proper responsibility is not fit for his post.

Again, when an officer, other than the one with whom the first decision rests, forwards a report on any subject to higher authority, he, in so doing, should state his views and make such observations from his local knowledge of the matter as will enable the superior appealed to to come to a correct conclusion.

Matters referring to any technical knowledge are not complete without the professional opinion of the head of the department concerned being attached. Thus sanitary matters should have the opinion of the principal medical officer attached, matters relating to the construction of military works, etc., that of the commanding engineer.

The Queen's Regulations lay down certain general instructions relating to correspondence, the leading features of which are the following :—

Each letter is to refer to one subject only and each must contain full information of the subject in hand.

Two or more letters may be sent under one cover. Letters to be written on foolscap paper with a blank half or quarter margin on the innermost side of the paper if bound up.

All paragraphs to be numbered so that in reply certain paragraphs may be quoted.

Enclosures, if any, are to be described in the margin when few, when there are many a separate schedule must be attached.

Letters are to be headed :—

From

Rank and name,

To

Rank and name,

Place and date.

Correspondence can be conducted in two different ways:—

1. By formal letters.
2. By memoranda.

1st, Formal letters are used in opening a correspondence or in reviving a subject which has lain dormant for some time, and always from an inferior to a superior. It is also advisable to use the formal type between equals little known to each other,—also when a superior wishes to call an inferior to account the formal letter gives it a more important and serious aspect.

2nd, Memoranda are of two kinds:—original, such as emanate from a staff officer by order of the general as a substitute for a letter,—and those which are like a docket or minute remarking or correspondence in hand.

The first kind is the usual method for communicating orders of a passing character or of obtaining information. The same paper is often passed on to the different officials concerned, in which case the several addresses are written on the front sheet at the top of the margin with the word *Pass* above and “To be returned” below. The officers initial and date it, and pass it on.

Ex : *Pass*
 O. C. R. A.
 O. C. 20th Regt.
 “To be returned.”

A large proportion of correspondence requires an opinion from some one or more officers,—in that case the Staff Officer writes on it “Forwarded for information and guidance,” or for “Perusal and remarks,” it is then returned initialed, dated, and with the remarks called for. If the remarks are lengthy they are written on a separate sheet of paper, if brief, they are written on the document itself. A sheet of foolscap folded in four gives four columns for remarks at the back. The original margin should be left for ultimate superior decision.

Mode of Signing and Addressing Correspondence.

Formal letters are always signed:—

I have the honour to be,
Sir, (or My Lord, etc.),
Your obedient servant,
Name and rank.

In correspondence between independent equals the officer always signs himself though the letter is not necessarily written by him. If the officer who opens the correspondence wishes to employ his staff he will address the staff of the other.

Memoranda are generally headed by the official position of the recipient, and signed and dated by the writer. As:—

Place and date.

C. R. E.

(Signed), Name and rank.

A subordinate officer always signs the correspondence himself and addresses the staff,—as the commanding officer of a regiment addresses the brigade major or other staff officer.

If a superior writes to an inferior, as a rule the staff officer signs. If it is a memorandum he writes "By order" above his signature, in a letter this is not necessary as the preamble embodies it. If the officer addressed is not under the orders of the Staff Officer's Chief, he would write to the staff of the other in a semi-official manner as—"the major general would be glad, etc.," and signed by the Staff Officer.

If a staff officer has to act upon a document in the absence of his chief, when it is obvious that the opinion of his chief is not really necessary, he signs such a document "for" his chief instead of "by order." The more regular routine, and one that should be done in important matters, would be for him to find the next senior officer and take his orders.

Documents received in a staff office belong to that office, but if they pass to a superior office they remain there for reference.

Access to official documents is not allowed for private purposes or for publication unless permission is given from proper authority.

REGISTRY OF DOCUMENTS.—The object to be attained in all offices is to keep a sufficient record of all transactions that take place with the least amount of labour.

The old practice was to copy every document,—now a General Register Book is kept, and frequently two or three words in the column of remarks are sufficient for a record. Every document (not return) emanating from, or passing through, the office is noted in this register,—and every document receives an office number. As other offices also number their documents it is necessary to have a particular stamp or mark,—as, two red lines under the number, etc.

An office, where correspondence is voluminous and varied, requires a practiced and intelligent person to keep a register properly, so as to give a concise history of each subject by brief explanatory and expressive abstracts of correspondence; this saves much time in the end and reference to correspondence itself.

The register should be a blank book with blue lines and ruled across as required into the necessary number of columns. There should be sufficient columns to contain the following information:

1st, Office number. 2nd, From whom received and date of receipt. 3rd, General subject. 4th, To whom sent and date of despatch, and also date when returned to office. If the document has to go to several places there must be several columns similar to the 4th. The last column is the column of remarks stating briefly the result of the correspondence and where the document is finally lodged. If the subject is of a confidential nature insert in 3rd column only so much as will recall its purport,—the correspondence itself being copied in a confidential book kept under lock and key. If the document first emanates from the office write the word "Office" in the 2nd column.

For the sake of clearness the office number, and dates on which the documents are returned to the office are generally entered in red ink.

In addition to this General Register, letter books are kept for copying documents of importance which are not kept in the office. If the correspondence with one branch is voluminous, as say with the Quarter Master General, a special Q.M.G. letter book should be kept. A General Letter Book is always kept for miscellaneous correspondence.

Every office orderly should have a little book of his own for letters entrusted to him to deliver. The number of the document, date, and address are entered,—and there is a column for the recipient to initial and date. If posted, the word "Post" is written against it.

When an office, such as a Brigade Major's office, has to be opened for active service or manœuvres, it should be done with as little office paraphernalia as possible. The following books are essential and need not as a rule be exceeded :

1. General Register, 1 General Letter Book, 2 or 3 Guard Books, foolscap size, for pasting in loose documents and important returns, 2 or 3 orderlies' memorandum books,—and, if on service, several memorandum books for writing orders.

The following are the details of correspondence which belong to the Adjutant-General's Department :

All complaints and reports as to arms, accoutrements and ammunition obtained from the Ordnance Store Department go to the Adjutant-General. The General in command assembles boards, and the reports ultimately reach the Surveyor General of Ordnance through the Director of Artillery and Stores. So also complaints, etc., about clothing go to the Adjutant-General, ultimate reference being the Surveyor General through the Director General of Army Clothing. Routine matters are carried on direct between the regiment and the Ordnance Store Officer or Director General of Army Clothing, etc.

To the Adjutant-General's Department also belong all matters

relating to discipline, Courts Martial, records of officers' and soldiers' services, garrison rosters, guards, fatigues, military police, hours of gun fire, closing gates, passes to civilians, furloughs, leave of absence ;—also musketry instruction, transfers, discharges, etc.

Applications for medals with or without gratuity and war medals, go to the Adjutant-General in London,—whereas application for medals *with* annuity, V.C. medals, and Distinguished Conduct medals go to the Military Secretary.

To the Quarter Master General's Department belong :—

All movements of troops by sea or land,—quartering, camping, hutting and cantoning of troops,—regimental canteens and recreation rooms,—the order of march, reconnaissances, occupation of ground by troops, military surveys, etc.

Topographical and strategic subjects give but little correspondence in peace time except to the Intelligence Department, but in war time such correspondence is immensely increased.

Movements of troops in England, whether in large or small bodies, are performed under the authority of a "Route" which conveys Her Majesty's authority, signed by the Secretary of State for War, for such movements. This Route is necessary to legalize the drawing of billets, requisitioning of carriages, the privilege of passing tolls, etc., and are issued by the Quarter Master General's Department. When a movement has to be undertaken suddenly, the Commanding Officer gives the officer commanding the party to be moved a certificate stating that a Route has been applied for, and on the authority of this certificate constables have to furnish billets, etc.

The actual payment to the railway or steamboat company is made by a warrant, a sort of cheque drawn on the District Paymaster, who recovers the sum from the public.

In England, the Transport Branch of the Admiralty provides sea transport on requisition of the Quarter Master General's Department ; abroad, the senior naval officer has to furnish these. For small detachments at home, if the Admiralty have no ships available, or abroad, if there are no naval officers, the Commissariat Department may have to provide water transport.

The Commissariat and Transport Department always provides all transport by land, and inland water transport as boats, ferries, etc., but not railway transport.

All arrangements for embarking and disembarking troops come under the Quarter Master General acting in concert with the naval authorities or other persons who provide the shipping.

QUARTERING OF TROOPS.—All the military side of the question, as the distribution of troops, what stations are to be occupied by particular corps, what barracks each regiment is to occupy, etc., are

matters for the Quarter Master General. The Commissariat Department deals with the actual handing over, distribution, appropriation, and charge of all occupied barracks.

Camping and hutting on service are Quarter Master General's questions. This department regulates the selection and allotment of site, also sanitary arrangements in conjunction with the Principal Medical Officer,—and in case of huts in conjunction with the Commanding Royal Engineer.

CHAPTER X.

Conditions and Principles of Supply in time of War.

The value of an army depends upon its efficiency as much as on its numbers. To be thoroughly efficient the men must be healthy, well fed, clothed, and armed, besides being well drilled and disciplined. It is, therefore, most important that there should be an ample supply of all necessities,—especially reserve ammunition. The want of the latter was one of the causes why General Meade was unable to follow up his success after repulsing the attack of the opposing army at the battle of Gettysburgh,—and the want of proper staff and transport arrangements frequently prevented offensive operations both on the part of Federal and Confederate generals in the late civil war.

In the recent war in Afghanistan, when Candahar, which was garrisoned by a comparatively small force, was in danger of falling into the hands of the enemy, it was expected that General Phayre would hasten to its relief, as he had a sufficient force under him about Chaman only 79 miles, or 4 forced marches, distant. That General was, however, unable to move for want of proper transport, and it was left to General Sir F. Roberts to relieve Candahar by hastening from Cabul, 314 miles distant, at the head of a properly equipped flying column. This is another proof, if one were needed, of how impossible it is for an army, however good its *moral* and discipline, to take the field if left unsupplied with the requisite transport and stores.

The subject of the supply of an army in the field may be divided into the following heads, some of which have been already considered :

I. Necessities for an army in the field. Provisions for men and horses. Camp equipage. Intrenching and other tools. Harness and saddlery. Clothing and boots. Arms, ammunition and accoutrements. Care of, and stores for, the sick and wounded. Veterinary attendance for horses, etc.

II. Departments for providing these necessities: Commissariat and Transport, and Ordnance Store Departments, Medical Department, Veterinary Department.

III. Estimate of the amount of supplies required per day :—

Take as an instance an army of 30,000 men and 5,000 horses, each man's daily ration being 1 lb. of biscuit, 1 lb. meat, 3 oz. groceries,—and forage for each horse, 12 lbs. oats and 12 lbs. hay. The total weight will amount to 185,625 lbs. = 92½ tons. If live cattle are taken with the army the number to be killed per day can be roughly calculated from their average weight, viz.: 360 lbs.

IV. Sources from which stores are obtained:—

(a). From home or base of operations.

(b). From the country in which operations are being carried on.

V. Methods of obtaining stores from the country operated in.

VI. Methods by which stores are transported. Transport train, canals, rivers, railways.

VII. Magazines. Necessity for forming them.

VIII. Security of the line of communications.

The Supply of Ammunition in the Field.

In all armies every soldier of infantry and cavalry carries with him a certain supply of ammunition for his fire arm, in addition to which a further supply is carried with the regiment and called the Regimental Reserve.

In the artillery every gun has with it a supply of ammunition in its limber and axle-tree boxes, and a further supply in the ammunition wagon which is attached to it and which may be looked upon as the Regimental Reserve.

In the British army every battalion of infantry has 3 small arm ammunition carts to carry its regimental reserve. Each cart has two horses and one driver, the latter being furnished by the battalion. Every man carries 70 rounds of ammunition, 40 in his pouch, 10 in the expense bag and 20 in the pocket of his valise, and 30 more per man are carried in the Regimental Reserve.

The Staff Sergeants carry pistols.

Each regiment of cavalry has one Small Arm Ammunition Cart. Every man carries 30 rounds per carbine and pistol and an additional supply is carried by the Regimental Reserve.

Artillery.—Every 9 Pr. gun carries 4 Case shot on the gun carriage, 36 rounds in the gun limber, and 108 in the ammunition wagon with its limber. Each box carries 14 Shrapnel and 4 common shell.

The 16 Pr. gun carries 4 Case shot on the gun carriage,—and 24 rounds in the limber and 72 in the wagon. Each box carries 9 Shrapnel and 3 common shell.

In addition to the regimental reserve there are three further reserves of ammunition:—

1. The Divisional Reserve,
2. The Army Corps Reserve, } in charge of the Artillery.
- 3 The Third Reserve in charge of the Ordnance Store Department.

The Adjutant-General of an army in the field is responsible to the General Officer commanding for the supply of ammunition for that army, and the General Officers commanding divisions are responsible for maintaining their reserves of ammunition.

1ST RESERVE, OR DIVISIONAL RESERVE.

Each Division of the army has a reserve of ammunition carried by the Artillery.

This reserve consists of one major, 2 lieutenants, one quartermaster, one surgeon and one veterinary surgeon, 203 N.C. officers and men, 253 horses and 55 carriages.

The carriages are—29 S.A.A. Carts for infantry ammunition, 7 Artillery Ammunition Wagons, and 13 General Service Wagons for artillery ammunition, 2 spare gun carriages, 1 forge wagon, 2 wagons for stores and one rocket wagon.

A regiment requiring ammunition sends an empty cart to the rear and obtains a fresh one without unloading but by changing the teams,—so also an artillery battery obtains a fresh ammunition wagon.

The corps artillery is supplied by the divisional wagons, each of the 3 divisions therefore carries its share.

The ammunition carried is 40 rounds per rifle (20 per cavalry carbine), 72 per 16 Pr. gun, 108 per 9 Pr., and 36 per pistol.

2ND RESERVE, OR ARMY CORPS RESERVE.

Each Army Corps has also an ammunition reserve divided into 3 divisions. A division has the same officers as a divisional reserve except that it is commanded by a captain.

This column has 18 officers, 516 N. C. officers and men, 509 horses and 105 wagons.

All the ammunition is carried in 87 General Service Wagons, of which 36 are for infantry, 9 for 9 Pr. guns and 42 for 16 Pr. guns. Each wagon carries about 230 boxes of S.A. ammunition or 136,000 rounds of Martini-Henry,—the remaining wagons are, 6 spare gun carriages, 9 wagons for stores and 3 forge wagons.

This reserve carries 40 rounds per rifle, 108 per 16 Pr. gun and 44 per 9 Pr. gun.

THE 3RD RESERVE.

This reserve is in charge of the Ordnance Store Department and is kept at the Grand Depot at the base of operations or at intermediate depots, which are generally necessary at every two days' march

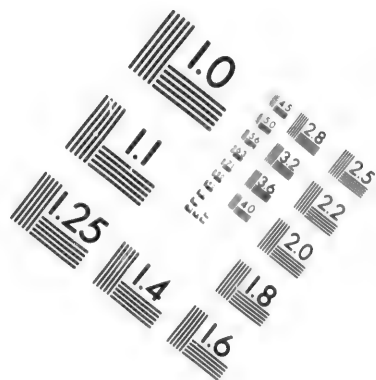
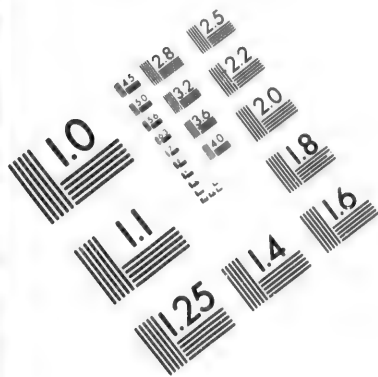
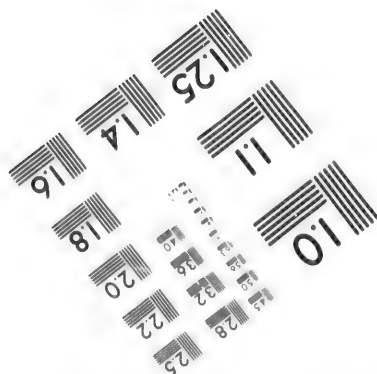
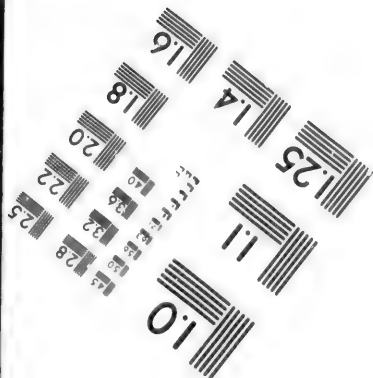
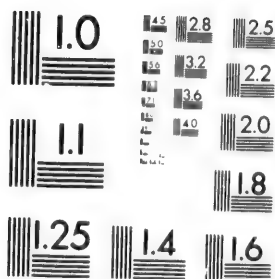


IMAGE EVALUATION TEST TARGET (MT-3)



14
16 28
32 25
36 22
20
18

10

from the base of operations. It consists generally of 300 rounds per rifle, 300 per 16 Pr. gun and 200 per 9 Pr. gun. In a great war this supply would have to be increased, especially the infantry ammunition.

GENERAL RULES FOR THE GUIDANCE OF AMMUNITION RESERVES.

REGIMENTAL RESERVES.—The 3 carts belong to the regimental establishment, but on the march in brigade column of route, or manœuvre, or in action, only one is to be with the battalion, the rest being massed in brigade columns unless otherwise ordered by the General of the Division. The same rule applies to this reserve if carried on pack animals.

Officers commanding corps are responsible to maintain their supplies of ammunition, and they obtain fresh supplies direct from the officer commanding the Artillery Reserves.

DIVISIONAL RESERVE.—Each divisional reserve column is to be in two sub-divisions which may be separated. The first consists of 13 G.S. Wagons of gun ammunition, 10 S.A.A. Carts and a rocket wagon, the remaining carriages go to the 2nd sub-division.

Empty carts and wagons are always to be filled up from the 2d sub-division,—the 1st sub-division being kept intact ready to be sent to the front on an emergency. When the Division is engaged, this first reserve must, under all circumstances, be at hand, and not more than one or two miles in rear under the orders and charge of the officer commanding the divisional artillery. The brigades and batteries must be informed of the position of this reserve.

The officer commanding the divisional reserve is responsible to keep his column filled up from the army corps reserve, empty carts or wagons being sent to the rear when they require replenishing.

ARMY CORPS RESERVE.—Each of the 3 divisions of this reserve has a full supply for one divisional reserve column, thus each division can follow the divisional reserve to keep it filled up, or the three divisions may be massed together.

This reserve should, as a rule, not be more than one day's march (for infantry) in rear of the front line. If possible no portion of it should be brought under fire since it is a connecting link between the divisional reserve and the depot at the field arsenal in the rear. The officer commanding the divisional reserve should be kept informed of its position or of that of any of its advanced detachments. On an emergency, the filled carts or wagons may be sent to the front instead of filling up the divisional reserve carts.

The officer commanding this reserve must keep in communication with Head-Quarters.

The Divisional and Army Corps Reserves are to be completed from the 3rd Reserve in charge of the Ordnance Store Department upon requisitions of the commanding officer R.A., supported by re-

ceipts for the issues made to the troops. On emergency, however, the store officers are to make issues on requisition from the officer commanding the artillery reserves.

As a general rule the proportion of gun ammunition required for an army in the field is calculated at 500 rounds per gun, and of ammunition for small arms at 480 rounds per man.

The following table shows how these are distributed :

ROUNDS OF AMMUNITION.			
	PER GUN.		SMALL ARMS PER MAN.
	9 Pr.	16 Pr.	
In possession of the Troops }			
Regimental Reserve }	148	100	70 } 100
Reserves } 1.Divisional Reserve	108	72	40 }
with the Art. } 2.ArmyCorps "	44	108	40 } 80
3. Ordnance Store Reserves at }	300	280	180
Grand Depot or Intermed. Depots }	200	300	300
Total	500	580	480

When pack animals are employed, each animal can carry two boxes of ammunition.

Equipment.

INFANTRY EQUIPMENT.—The question to be solved is—how can a soldier's kit be reduced to a minimum,—and how can the requisite arms, ammunition, and kit, be best carried with least fatigue to the soldier, and with least hindrance to his fighting power ?

It was found that the old knapsack produced disease of the heart and lungs, and that the weight was badly distributed, and the valise equipment was adopted in consequence. The total weight of the valise equipment is 5 lb. 10 oz. ; the centre of gravity is brought near the point of suspension, the weight coming on the shoulder blades and hip bones, and the muscles and arteries about the arm pits are no longer cut by straps. A soldier's minimum kit consists of the valise equipment, pouches, bayonet, water-bottle, and mess tin.

Many advocate that the valises should be carried for the men, the Germans are, however, of the contrary opinion. In the Austro-Prussian war in 1866, the Prussians had their knapsacks carried for them, but great inconveniences resulted, and it added so largely to the transport, that this plan was not followed in 1870. The chances are, in rapid movements, that when men once get separated from their packs they never see them again.

In the Crimea the British Army suffered great privations from having disembarked without their packs, which they did not receive for five or six weeks. In the Italian war of 1859 a French regiment

took off their packs as a special case and in order to make a final effort across very rugged and difficult ground at the battle of Solferino.

The principle of adding to the regimental transport by carrying soldiers packs is not to be recommended, except under special circumstances as at Solferino, or in investments such as at Plevna. The amount to be carried should be reduced to a minimum, and once determined on a soldier should rarely part with his pack.

It is, however, advisable that soldiers should carry extra ammunition as a system of long range firing will probably be adopted in future wars. Rapidity of fire entails a great expenditure of ammunition, but when this rapidity is combined with a deliberate commencement at long ranges, the expenditure will be enormous,—and double the present regulated amount of ammunition would hardly be an excessive amount for soldiers to have at hand. Besides this, many advocate the carrying of intrenching tools. All this points to a reduction of other articles to be carried so that men may not be overweighted, and the kit should therefore be cut down to a minimum. In the war of 1877-78 the knapsack was frequently not used but the men carried a bundle of clothes. It is suggested that in lieu of the valise, men should carry in the field a waterproof wallet over the shoulder, in which a change of clothes may be stuffed. The weight comes on the shoulder and can easily be transferred from shoulder to shoulder.

REQUISITES OF A GOOD MILITARY RIFLE.—A military rifle should have, with its bayonet fixed, sufficient length to afford protection against cavalry, about 6 feet is considered necessary for this,—and of sufficient length, without the bayonet, to allow the rear rank to fire without injuring the front rank; it should be of sufficient strength to bear rough usage on service and of the minimum weight consistent with absorbing enough recoil so as to prevent, when properly handled, excessive “kick” resulting in injury to the shoulder, leading to involuntary shrinking from firing and unsteadiness in taking aim. The size of the bore should be large enough to give a sufficiently heavy bullet for a crushing stroke combined with a long flight, without, however, increasing the weight of the bullet or size of cartridge so much as to dangerously reduce the number of rounds possible to be carried. The breech mechanism should be such as will stand rough usage and exposure. A bullet large enough to disable is sufficient, as it is more advantageous to disable than to kill. A man disabled in action takes away other men to attend to him; men wounded hamper an army, and a man once put *hors de combat* is so generally for the campaign,—a small bullet will do this, and a lighter bullet gives a lighter weapon and lighter ammunition. Its flight is more important than its power of stroke, facility in loading, and rapidity of fire. Accuracy of fire is essential, and flatness of trajectory covers a greater zone, and power of penetration accompanies a low trajectory.

Expenditure of ammunition depends greatly on the discipline of an army. Want of discipline and unsteadiness leads to enormous waste of ammunition, and excessive rapidity of fire also tends to increase unsteadiness.

In the Franco-German War the French suffered much from waste of ammunition, but the Prussians affirm that great rapidity of fire is no objection in their well-disciplined army.

Experts can fire the old muzzle loading Enfield rifle 5 times a minute and the Martini-Henry 25 times. It is estimated that with the Martini-Henry a man can fire 12 shots a minute with effect.

In Switzerland the infantry is armed with a repeating rifle,—and other powers will, it is expected, shortly adopt this arm. Experiments tend to show that the rapidity of fire with a repeating rifle is about doubled.

The long Snider rifle, which is the old Enfield converted, is 4 ft. 6 in. in length, which, with the bayonet 1 ft. 7 in. makes a total length of 6 ft. 1 in. The bore is .577 in. Weight 9 lb. 2 oz. A packet of 10 cartridges weighs 1 lb. 0 $\frac{1}{4}$ oz.

There is only one pattern of Martini-Henry (no long or short one as the former Snider), but there are different lengths of stocks for tall or short men, and the barrel is of steel. The rifle is 4 ft. 1 in. long, which, with the ordinary bayonet gave only a length of 5 ft. 8 in., so that a bayonet of extra length has been supplied (22 $\frac{1}{2}$ in.) to bring the two up to the proper length. Weight 8 lbs. 12 oz., bore .451 in. A packet of 10 cartridges weighs 1 lb. 1 oz.

The shorter length of the Martini-Henry affords better balance for shooting, and it is handier for trailing when manœuvring. It is only sighted up to 1,400 yards, which is a great fault, as in future wars fire will probably be opened at far greater ranges. The rifles of foreign countries are sighted up to about 1,800 yards.

AMMUNITION is made up in packets of 10 cartridges,—600 rounds of Martini-Henry being packed in an ammunition box. An S.A.A. Cart carries 16 boxes, and therefore 9,600 rounds. Weight of a full box is 79 lbs. A box of Snider ammunition holds 560 rounds, weight 72 $\frac{1}{2}$ lbs, each cart therefore carries 8,960 rounds.

It is most important that an army taking the field be supplied with a proper amount of ammunition as failure at a critical time may prove disastrous. Nominally in England 1,000 rounds per rifle are allowed, but this has never been carried out. The Continental estimate is to place 600 rounds per man at the disposal of the army, including all reserves.

The German soldier carries 40 rounds in pouch, and 40 in knapsack. Regimental reserve 22. Divisional reserve 65. The French soldier carries 90 in pouch and knapsack and 30 in divisional reserve, (no regimental reserve).

When statistics of the expenditure of a whole division or even of a regiment are given in certain actions, these afford no guide as to the actual number of rounds that a man should carry,—as frequently only a small portion of the troops are heavily engaged and some may never fire a shot.

The highest expenditure of the Prussian army in 1866 was at the battle of Koniggratz where one regiment fired 72 rounds per man. At another time a regiment had a low average, yet 3 companies fired over 60 rounds and had to draw on the reserve. In the great battles round Metz in 1870 the greatest German expenditure in a division was 20 rounds per man.

HEAD-DRESS.—Owing to the frequent use of entrenchments in modern warfare the number of head wounds received by troops in action as compared with wounds in other parts of the body have been much increased, consequently a suitable head-dress for infantry as a protection against rifle bullets is now engaging the attention of military men. A rifle bullet striking a firm well rounded surface and failing to penetrate it is easily deflected from its course, and it is considered that at a range of about 1,200 yards and over comparatively few bullets would penetrate a firm well rounded helmet, of leather, say. On the other hand, the head-dress should be light, comfortable and well ventilated, otherwise men will be liable to suffer more from heat, and if the head-dress is not comfortable they are apt to throw them away in action.

CAVALRY EQUIPMENT.—Formerly Cuirassed cavalry only were called heavy. In the English service 4 regiments of dragoons are heavy, 6 are medium and also 5 lancer regiments, and the 13 hussars are light.

The real difference is in the weight of the men, actually, the weight of equipment for heavy cavalry is often lighter than for light cavalry.

The weapons are the sword, lance, carbine and pistol. All cavalry have the sword. In England there is one pattern sword, the blade of which is 35 in. long; it is called the light cavalry sword. It has been suggested that swords should be of several sizes for different men, as it is against reason to have one pattern for all. The English sword, is heavy, inefficient as a cutting weapon, the handle is unwieldy, and the steel scabbards, which destroy the edge, are heavy and noisy. In the Indian Mutiny, the natives, alive to these defects, used the English blades well sharpened, with different handles, and wood scabbards lined inside with leather, and these made capital swords.

It has been suggested to carry the sword on the saddle,—and with good reason. If the man is on foot and separated from his horse, the sword is no use and only in the way, the carbine is then only of service (or the pistol with N.C. officers), and these arms being carried by the horse, he may be left on foot with a useless

weapon ; instead, therefore, of the man carrying the sword, many consider that he should carry his carbine or pistol.

LANCE.—Only issued in England to lancers ; length 9 ft. 3 in., weight 4 lbs. The lance can reach artillery behind guns and is effective in pursuit.

CARBINE.—The value of the dismounted fire-action of cavalry in modern warfare is now universally recognized, and all cavalry should be able to fight dismounted. In the war of 1870 it was shown how the operations of cavalry, not armed with a far ranging carbine, were restricted by a few peasants furnished with rifles. All British cavalry now carry the Martini-Henry carbine sighted up to 1,000 yards ; it has a special cartridge but the rifle cartridge can be fired from it.

PISTOL.—N.C. officers and trumpeters carry a revolver.

PICKETING HORSES.—A picketing arrangement should be secure and if possible light enough to be carried without carts.

There are several systems. Formerly a fetlock rope with a heel rope were used. The horse carried a peg with chain and shackle to attach to the fore fetlock, but horses injured their fetlocks by struggling. Headropes were then used instead with one or two heel ropes,—but a stampede of horses occurred at manœuvres with this arrangement, so the long ground ropes with head attachment used with heel ropes were introduced. Long picket ropes are used, the pickets being driven flush with the ground, and the ropes buried about 18 inches to get better hold. The disadvantage of this arrangement is that it requires carts to carry,—so that when orderlies, small parties, etc., are detached, they cannot picket their horses. In Canada during the Fenian raids a screw ring with a gimlet pointed screw was used, so that each man could attach his horse to a tree, or post, etc. N.C. officers carried gimlets in addition in case of the screw not working well ; these screws were carried in the wallets.

Rations.

A few words on rations may not be out of place.

An average man between 20 and 30 years of age requires about 40 oz. of solid food a day and 50 to 80 oz. of liquid. If hard work is given he requires more.

The rough weight of provisions should, however, never be taken without considering the nutritive proportions of each, for most eatables contain a proportion of water and indigestible cellular tissue the weight of which must be excluded,—and the real weight of nutriment a day for adults should not be less than 28 oz.

Food in general has two descriptions of nutritive properties :

1. Carbonaceous, to maintain respiration.
2. Nitrogenous, to maintain wear and tear of body.

A most successful dietary is 3 parts of carbonaceous to 1 of nitrogenous.

TABLE SHOWING PERCENTAGE OF NUTRIMENT.

	FROM DR. CHRISTISSON.		Total nutriment in 100 parts.
	Carbonaceous.	Nitrogenous.	
Wheat Flour	71.25	16.25	87.5
Bread	51.5	10.5	62.0
Oatmeal	65.75	16.25	82.0
Barley (Pearl)	67.0	15.0	82.0
Peas	55.5	24.5	80.0
Potatoes	24.5	2.5	27.0
Lean Beef or Mutton.	0.	27.0	27.0
Fat of Meat.....	100.	0.	100.
Average Meat Beef and Mutton	15.0	20.25	35.25
Rice	73.12	9.48	82.6
Bacon	62.5	8.36	70.86
Cheese	0.4	64.6	65.0

MEAT.—The supply of fresh meat in the field is uncertain. Salt meat engenders disease and its nutritive value is hard to determine.

One of the greatest wants during the siege of Paris was animal fat, the desire for which amounted to a craving.

Tinned meats are not equal to other meat, they do not satisfy the appetite, they derange the digestive organs and if lived on for long reduce men in strength and physical vigour. Liebig's extract, concentrated beef tea, etc., are not fit for much. Horseflesh is unsuitable and offensive to the taste, though considered by some better than tinned meats.

An average Ox yields between 300 and 600 rations, a Sheep 35 to 60 rations, a Pig 80 to 100.

Biscuit is digested with difficulty and ought not to be used for long,—yet it is easily stored and moved on the march, and it is imperishable.

Cheese is nutritious and easily preserved.

Rice is very beneficial especially with salt meat.

Peas are nutritious but hard to cook.

Potatoes are heavy and bulky for campaigning.

Vegetables are absolutely necessary,—to save bulk and weight compressed vegetables are sometimes used.

Meat-Biscuit is not liked by the men but is very good as a reserve ration.

Coffee and Tea are both advocated and they possess a renovating power.

Rations for 1,000 men including meat (not fuel) for one day, with the packings, barrels, bags, etc., weigh 3,289 lbs. or nearly 29 cwt., which one General Service Wagon can carry. Their bulk occupies about 100 cubic feet. This gives 3.3 lbs. per ration including meat, bread, and share of package, or 1.7 lbs. per ration if meat walks.

The normal daily ration of a British soldier at home is $\frac{3}{4}$ lb. meat and 1 lb. bread. Generally the soldier has $\frac{1}{2}$ lb. bread with tea or coffee for breakfast and again for supper. His dinner consists of boiled beef 12 oz., soup in which the meat was boiled containing 8 oz. of vegetables, or 2 of rice or barley, potatoes 16 oz., bread 5 oz. Many maintain that our soldiers are underfed, especially as concerns the meat ration which includes bone.

A field ration consists of 1 lb. meat, and 1 lb. of biscuit or $1\frac{1}{2}$ lb. of bread, coffee $\frac{1}{8}$ oz., tea $\frac{1}{8}$ oz., sugar 2 oz., salt $\frac{1}{2}$ oz., pepper $\frac{1}{8}$ oz. When doing hard work troops should receive $\frac{1}{2}$ lb. meat in addition.

In the Ashantee campaign a ration consisted of :

$1\frac{1}{2}$ lb. of bread or biscuit, $1\frac{1}{2}$ lb. meat salt or fresh, or 1 lb. preserved meat (no bone); 2 oz. rice and peas or 4 oz. preserved potatoes; 3 oz. sugar, $\frac{1}{2}$ oz. salt, $\frac{1}{8}$ oz. pepper, $\frac{3}{4}$ oz. tea, and 1 oz. lime juice issued 4 times a week.

Experiments have been made in compressing food, and it is believed that the weight of rations may be diminished $\frac{1}{4}$ th of what they weigh before being compressed. The result of this will be that instead of 52 rations weighing 160 lbs. they will weigh 27 lbs. and reduce transport enormously.

FUEL.—3 lbs. of wood or coal constitute an ordinary ration; $1\frac{1}{2}$ lb. extra in cold climates for warming. Wood is difficult to carry and troops must obtain it as best they can. Stalks of Indian corn, dried dung, bones, etc., are useful substitutes for fuel.

When straw for bedding is issued to troops it is done at the rate of 72 lbs. per 5 men.

FORAGE.—The peace ration per charger is 8 lbs. oats, 10 hay, 12 straw; field ration, 10 lbs. oat, 12 lbs. hay per charger, 8 lbs. oats, 10 hay per bat horse and draught animal,—2 lbs. of each extra when picketed out or when heavy work is required of them.

Twenty-eight lbs. of unthreshed corn is considered a ration, and 28 lbs. of green forage is equivalent to 10 lbs. of dry hay or chopped straw.

Compressed hay is reduced in bulk rather more than one-half and always used if possible. Three cubic feet of an ordinary hay stack yields one ration.

Barley or Indian corn are sometimes used in lieu of or mixed with oats. Two lbs. bran are substituted for 2 lbs. oats when a horse requires bran.

A compressed ration used in Abyssinia consisted of 12 lbs. chopped hay, 10 lbs. bruised oats, 2 lbs. bran. Weight only 22 lbs.; bulk after compression, $\frac{1}{4}$ d of its original bulk.

Straw is too bulky to carry and the country must be depended on for it.

WATER.—For drinking and cooking purposes a man requires from 6 to 8 pints according to the climate, and a similar amount should, when possible, be allowed for washing purposes. In stationary camps the minimum daily allowance should be 5 gallons for all purposes, washing clothes included.

Horses require 6 gallons a day when not doing work, but this may have to be increased up to 12 gallons according to the nature of the work and climate. Two gallons extra should be allowed for washing them.

For rapidity of movement, unless troops are to starve, it is absolutely necessary they should carry, besides reserve rations, at least one day's ordinary ration, and the most suitable means for carrying rations on the march and the nature of ration most suitable to carry are questions of pressing moment. A hunch of bread and cold meat which have been shaken together in a haversack for a whole day is but a poor repast to look forward to at the end of a long day's march or a day's fighting, yet the British soldier has nothing better to expect at present. In the French army a proportion of men carry tins of preserved meat while others carry pots, etc., for cooking; many consider, however, that the French soldier is overweighted, yet, in spite of this, he is able to perform long marches without over fatigue.

Methods of obtaining Supplies.

* In the feudal period armies consisted of an assemblage of knights, barons, and squires, with their retainers, who made war the pretext for enriching themselves by plunder. While moving in the enemy's territory they occupied a great extent of it, pillaging cities, villages, and farms, and ransoming captives of consideration. The idea of a highly organized force, making many long marches in succession, with the utmost rapidity, towards certain points, holding itself always prepared for immediate battle, and aiming to bring the adversary to terms, not by ravaging his territories, but by defeating his armies, and manœuvring wherever possible against his communications as his most vital points, could not possibly enter the mind of a leader in those days, since the first condition of such a mode of warfare was wanting. The collection of all kinds of stores and munitions necessary to an army, and the incessant forwarding of these to great distances throughout a long campaign, was a task beyond the resources

* From "Operations of War."

of the wealthiest feudal monarch. In later years when the power of the crown became absolute, and the monarch able to tax the people at his will, he surrounded himself with a standing army trained to act in concert, to operate by system, and animated by a military spirit,—even then, however, progress in the development of the science of strategy was slow as the population was sparse, infertile tracts of land frequent, roads few and bad, and artillery very cumbrous.

But, in the course of time, the change in the features of a country consequent on the advance of civilization affected the conditions of war. At all periods the population of districts had been accustomed to seek shelter from an invading army in the great towns which were fortified to resist attack. So long as artillery was ineffective and difficult of transport, a strong wall was sufficient for defence; but as roads improved and formidable artillery was enabled to accompany an army, the art of fortification grew in importance. Huge fortresses were consequently constructed, which being placed on proper strategic points as at the meeting of great roads, they became obstacles in the way of an invader that he could not neglect, as an advancing army dependent on its communications could neither pass by one of these obstacles nor easily take it. Therefore, in the wars of Louis XIV, whole armies were for months occupied in besieging towns, and Marlborough's battles bear but a small proportion to the number of his sieges.

As the military machine grew more manageable, and the means of supplying it improved with increasing wealth and population, enterprises became more extensive. Improved roads and vehicles enabled large bodies to move more freely,—improved cultivation gave them more abundant means of subsistence. Fortresses instead of being besieged were watched, or "masked" by detachments; and Frederick and Napoleon, preferring manœuvres in which they were confident of their skill, to the tedious process of sieges, moved deep into the heart of the theatre of war.

As the power of an army on a distant enterprise depended on its united and concentrated action, it was necessary to its full efficiency that it should be able to assemble at any time. It must, therefore, be accompanied by everything requisite for its maintenance. Food, ammunition, clothing, medicine, and recruits must find free access to it, and the stream of these supplies must be unceasing. The first preparation for war was the establishment of great depots and magazines, and these were collected in places that were secured from the enemy's attacks, either by natural defences or artificial fortifications. Frontier lines, strengthened for the defence of countries from the aggressions of their neighbours, of course afforded the most favourable points for the establishment of the magazines destined to supply an army of invasion. Thus, if France were at war with Germany, the Rhine afforded a natural screen, behind which might be collected

the necessary stores, and, when this barrier was further strengthened by a line of fortresses, a German army in France could operate in full confidence that the supplies necessary for its maintenance were safe, and that, if compelled to retreat, it would find amidst the fortified depots both subsistence and protection from disaster.

It would be of great importance to know for certain what particular points the generals on each side relied on for their supplies at all the stages of a campaign. But on this matter history is too often silent of necessity. For it is generally politic, if not imperative, to collect and deposit the supplies in secrecy, otherwise they would indicate the direction of an intended operation.

The Duke of Wellington's correspondence after the battle of Talavera sets in the strongest possible light the essential importance of magazines and the consequences of operating without them. The English army, leaving its depots in Portugal, had moved into the valley of the Tagus to co-operate with the Spanish forces which were opposing the French corps in front of Madrid. The junction of the allies effected, they had engaged and beaten the enemy at Talavera. As the commander of an auxiliary force, acting in conjunction with a native army, in a country which, though sterile in parts, yet afforded ample supplies, Wellington could not have anticipated any difficulty in procuring provisions, for which full value would have been readily paid; and he had accordingly entered Spain relying on the promises of the Spanish government to provide ample subsistence and means of transport for his army. Yet, victorious as he was, he speedily found that army crippled for want of food and forage; and, after numerous remonstrances, he was driven to execute what he had frequently threatened, and marched his troops back to Portugal.

"A starving army," he says, in narrating the privations of his troops, "is actually worse than none. The soldiers lose their discipline and spirit. They plunder even in the presence of their officers. The officers are discontented, and are almost as bad as the men, and with the army which a fortnight ago beat double their numbers, I should now hesitate to meet a French corps of half their strength."

"To carry on the contest with France to any good purpose, the labour and services of every man and every beast in the country should be employed in support of the armies; and these should be so classed and arranged as not only to secure obedience to the orders of the government, but regularity and efficiency in the performance of the services required of them. Magazines might then with ease be formed and transported wherever circumstances might require that armies should be stationed. But as we are now situated, 50,000 men are collected upon a spot which cannot afford subsistence for 10,000 men, and there are no means of sending to a distance to make good the deficiency."

Again he says, "if we had had 60,000 men (British) instead of 20,000, in all probability we should not have got to Talavera to fight the battle, for want of means and provisions."

Further he says, "If we could have fed, and have got up the condition of our horses we might probably, after some time, have struck a brilliant blow upon Soult at Placencia, or upon Mortier in the centre."

No general was ever more careful in accumulating great magazines and in protecting his communications than Napoleon. After Jena, for instance, when he had broken in a single day the power of Prussia, his first thought, after providing for the pursuit of the defeated enemy, was to establish a fresh and shorter line of communication with France, and to station on it great hospitals and depots of stores.

The base of supplies for an army in the field should, if possible, be of some considerable extent, in which the principal magazines will be established in positions safe from attack, with easy communication to the front. A navigable river running from the base parallel to the line of communications affords a very advantageous means of transport, as well as lines of railway and macadamized roads.

Smaller depots have to be established on the lines of communication, if possible only 3 or 4 marches apart, and if there are no railroads, each should contain provisions for the army for the same number of days, so that if forced to retreat, the magazines at each place would be cleared out as the army fell back.

England being an insular country, her base of supplies must be the sea and her principal magazines will have to be established on the coast where there is a capacious harbour with good inland communications. The base should, however, be extended as soon as possible by seizing other harbours along the coast.

In peace time troops are generally supplied by contract. In war,—1st, from home or magazines. 2nd, By contracts to deliver at the base or depot of operations. 3rd, By purchase in the country. 4th, By requisition or seizures.

Usually a combination of some or all these methods are had recourse to. Only the absence of all local resources can justify the adoption of the course of sending all supplies from home. War material and equipment must come from home arsenals or contractors, and if the line of communications be also blocked by food from home, a break down is almost sure to follow,—as much supplies of food as possible should, therefore, be obtained elsewhere. Even with railway transport, which is an immense advantage, if all the supplies be carried from the base there would be a failure, and animal transport must break down for a long line of operations.

Tempelhoff, who wrote on the supply of the armies of Frederick the Great was of opinion that 100 miles, or 6 days march, is about the utmost distance at which a force supplied by road transport could exist without halts, intermediate magazines, etc.

Seldom is it that no supplies at all can be obtained in the enemy's country. Even in Abyssinia certain supplies of forage and meat were obtainable,—at times though, as in Ashantee, we were bound to one narrow road, and the source of supply from home was the only one. In civilized and especially in friendly countries the contract system is largely used though not entirely. In the Spanish peninsula and in Belgium contractors supplied the British armies, and contractors at Marseilles supplied the French army in the Crimea.

This system has its disadvantages, as the contractor's idea is gain, he may supply bad articles and remedy is difficult when once the supplies are transported to the seat of war. Moreover contractors cannot be trusted entirely,—they swarm when the army is successful and disappear when it is not so. In Belgium, in 1815, when Napoleon invaded that country, they all fled for fear of their stores falling into his hands. Contractors, however, know the country, and their desire to enrich themselves may be turned to account for the good of the army if they are properly looked after by the Commissariat officer.

The best contractor is the occupied country, the supplies of which should be carefully husbanded.

The most advantageous system is to purchase on the spot so as to obviate long teams of transport. This system is adopted by the English wherever they move. It gains the good will of the inhabitants which is of immense advantage, and it produces a larger supply and enables more rapid movements to be performed.

In Spain and Portugal the English lived by purchase, the French by forced and unpaid requisitions. The English system was found to be most advantageous for rapid movements, as the inhabitants got provisions ready in a new place on the arrival of the troops, whereas the French only obtained supplies from the country that was actually in their grasp,—then delay ensued in their collection, their troops suffered in consequence and could not perform the same rapid movements as the English. It is found that when forced requisitions take place the inhabitants drive away their cattle and goods to prevent their being seized and when the army arrives it finds no supplies. The enmity of the inhabitants is also greatly increased leading to the killing of stragglers, sick, etc., and to a guerilla war generally. In 1814 Wellington's army had plenty even in France, whereas the French army in its own country was in want.

The first duty of Commissariat and Staff officers is to discover the resources of the country and proclaim their intention to pay all

demands at market price,—this should be widely published to the inhabitants. Reconnaissances should be accompanied by Commissariat officers with instructions for the inhabitants in their own language stating the intention to pay and inviting the inhabitants to deal in markets to be established in certain named places.

It should be an understood thing that all purchases of every description, no matter by what department the stores may be required, should be made by the Commissariat Department, so as not to have one department bidding against another in the market.

Requisition includes all compulsory seizures whether paid or not. Requisition as a regular system was introduced during the French revolutionary wars and was perfected by Napoleon. It was found to be simple in its operation and free from restraint, allowing the war to be energetically carried on. We used it in Spain, compelling the delivery of supplies but always paying for them. All requisitions should include transport and delivery to a named spot.

In future wars when campaigning in an enemy's country, it should doubtless be put under requisitions for money. To effect this the ordinary tax collectors of the country acting under the local authorities should be employed.

Requisitions by the troops themselves without the intervention of the Commissariat should be avoided,—it is only partially done, waste occurs and it leads to irregularities,—and of course absolute seizure by the troops must be strictly forbidden as it causes the inhabitants to remove their goods, and supplies are lessened, also the burden is not equally divided over the country, waste occurs and hostility is engendered. Requisitioning by the troops cannot, however, be altogether avoided by small parties, such as advanced guards, outposts, reconnoitring cavalry, etc., these must requisition for themselves, but their commander must be careful to conform to a certain system. This relieves the supply branch from all care of small bodies.

Billeting for lodging and food is one class of requisitioning, on payment or not. In 1870 the Prussian advanced parties lived by billeting. They also carried written requisitions duly prepared specifying the demand, time and place of delivery, for the use of the main body coming up in rear, which they sent to the local authorities. An essential feature in this system is to give the local authorities time to collect the stores. Such a first collection is never sufficient for a large body of troops, who should, therefore, be provided beforehand with rations for their immediate wants from the regimental transport, while the provision column collects the produce of requisitioning. Thus in the Franco-German war the German troops carried their own provisions and the provision columns filled up at the last place with the produce obtained by the requisitions,—this allowed time for the collection of supplies. At

first the Prussians paid for their supplies by receipts, but subsequently by money which answered better, (though frequently they did neither). The value of the receipts was doubtful, for had they been defeated the inhabitants might never have got their money, the Prussians, therefore, levied money on towns and districts instead; this the people preferred and became more willing to bring supplies to the army. Money payments must be made in coin recognisable in the country,—as in Abyssinia Austrian dollars were struck on purpose as this coin was known by the inhabitants.

Collision between the inhabitants and troops must at all hazards be avoided, and the local authorities may have to be supplied with an escort (a squadron of cavalry, say), to enforce their orders, as the local police and troops will have been driven away. So careful was the Duke of Wellington in the peninsula to avoid all chance of collision, that he would not allow his troops to cut down even a green field except under the direction of the local authorities, though he lent men to do the work.

Clausewitz, a great military writer, writing in favour of the system of requisitioning, says, that no other system can be substituted for it with the same certain result, magazines in rear being used as reserves only.

The duties of the Commissariat in the field are highly onerous. Staff officers should bear in mind that the difficulties of obtaining and even distributing supplies are enormous, and that it is absolutely necessary to have a good understanding between the Staff and the Commissariat, as supply has more often broken down from friction than from any other cause. At a rule, a break down is not due to failure of individual exertions nor to the personnel of the Commissariat, but to want of previous preparation and to a bad system; the utmost consideration is, therefore, due from combatant officers to the personnel of the Commissariat who are generally overworked.

It has been said that the essence of this system is to allow time for collection,—for this the resources of the country must be well ascertained before the outbreak of war. If the capabilities of a country for supply are not studied beforehand one of two things occur, either all that is possible is not extracted out of the country, or it is ruined. The system of requisitioning is a hardship even when everything is paid for, as it is liable to lead to a subsequent scarcity of provisions and hence to famine prices,—and care must be taken not to make the system unendurable to the inhabitants. The Prussian system is to use all the resources of the country before the home resources either in food or money are drawn on.

The Intelligence Branch of the Quarter Master General's Department, War Office, London, is charged with the duty of studying and collecting the capabilities of supply in different countries, and when war breaks out, Commissariat officers must obtain all such information from that office.

The Prussians had made a most careful study of each district in France so that none was overburdened, but each was requisitioned to its full amount. This system was found to be practicable in the rich plains of France and while the army was advancing. Supplies came in greatest on the 2nd and 3d days but then fell off, and, therefore, when an army halts, it has to be supplied from its base.

In estimating the capabilities of a country it must be noted beforehand whether the previous harvest was good or bad; if the latter, the ordinary estimate must be reduced by $\frac{1}{3}$ d, especially if near the next harvest when the year's supply will probably nearly have run out. The movements of cavalry must frequently be accommodated to the existence or not of a quantity of forage in certain districts, and these considerations may influence a general's movements.

As an example of successful billeting, an operation of Wellington's in the Peninsula may be quoted. He had to move 23,000 men from Portugal to relieve Badajoz without a collection of any supplies whatever,—this march had to be undertaken suddenly and no preparation beforehand was possible. The operation was successful, the troops living by being billeted on the inhabitants on payment.

It has been estimated that even the most densely populated place (which yields less food per head), can feed and quarter for one day its own number of troops without the slightest notice whatever, and, of course, proportionately for several days for smaller numbers. In large towns a large force can, therefore, be fed, but in small towns a large force would have some difficulty and a part of the troops would in this latter case have to be supplied from magazines. Agricultural districts will feed a considerably greater proportion per inhabitants because the stores at hand are infinitely greater, towns being supplied from stores in farms, etc. This question has to be considered in connection with breadth of front for battle, as the area over which troops can spread must be regulated by the commander, the distance being limited to the need of concentration.

When several corps are advancing in an enemy's country along parallel roads, it is necessary for the Commander-in-Chief of the army to allot a certain area of ground to each corps over which requisitioning is to take place, so as not to interfere with the corps on either flanks. For instance, in 1870, when the German main army entered France, the 9th army corps was advancing between the 2nd and 3rd corps,—the area, therefore, over which the 9th corps could requisition was limited to $1\frac{1}{4}$ miles to the right of the high road on which it was marching, and to $2\frac{1}{2}$ miles to the left.

Clausewitz estimates that in a moderately populated country 100-120,000 combatants could be subsisted without extending beyond their battle front, and that such an army could be fed on the march without any other means of subsistence,—but if the

army halts, retires, or remains concentrated, it must depend on other means. Napoleon marched in this way forming magazines behind him, but using the country as long as he could, only drawing on his magazines as a last resource, and this principle is carried out now.

Forage for horses in agricultural districts need not occasion anxiety if not destroyed,—it requires no grinding nor baking, and in each district some must be stored for the horses of the country.

In a country never occupied by troops, a force 3 or 4 times the number of inhabitants may be fed for several days, taking an average country including towns and agricultural districts. This estimate would include most European countries, provided several days' notice is given, and that the army advances, and is successful. Statistics as to the population of the country in each district must, therefore, be known beforehand. This estimate coincides with the opinions of a modern Prussian writer, General Bronssard von Schallendorf, who says that a very unfavourable case is where a detachment of 3,000 or 4,000 men has to be fed on a population of 160 to 170 per square mile. Most countries exceed this estimate of 160 per square mile and England has 420. An army corps of 35,000 men and 10,000 horses, marching with a front of 5 miles (on two roads, say), and encamping 9 miles deep (a fair allowance), can easily be fed in its advance from day to day, taking the usual rate of progress of 4 days marching to one of rest. Troops following it the next day, or later, could also live, provided, of course, the first army corps had taken precautions against waste and had stored up supplies for the troops following. It is, therefore, in perfect safety (he concludes) that an army of 100-120 men can march through a country without drawing on its own resources, and without exceeding that area which may be considered safe for concentration, provided it continues to advance.

If the country has been previously occupied by troops, say by those of the enemy, these will, of course, already have drawn largely on the resources of the district, and this must be taken into consideration. For a more permanent billeting including feeding, the force must necessarily be less. In this case one or two soldiers may be allotted to each family. It has been estimated that the average number in a family is five, and, therefore, to obtain the *minimum* number of soldiers who can be billeted for any length of time divide the number of inhabitants by five. On a pressure and for a few days a greater proportion than this have been billeted, as advanced guards, etc., who are lodged wherever they can obtain house room.

Depots of food and forage are formed at important junctions of roads and railways, also in large open towns but not in enclosed fortresses. Magazines are also formed where the mode of transport changes and stores have to be re-loaded, as where there is a shift from ship to rail, or rail to road, etc. Enclosed fortresses have few

gates, narrow streets, and the avenues to them are few, and hence for the collection and distribution of cattle, and all food which is bulky, closed towns are not appropriate. War material, however, being far less in bulk and safer in fortresses, can, with advantage be stored in them. A raid on provisions would probably not be so deleterious as a destruction of war material, for the latter coming all from home could not be so easily renewed. Of course there is no objection to storing provisions in entrenched camps such as Metz, the above rule only holding good when the town has but an enceinte covering a small area. Although open places are chosen for the storage of provisions, every effort should be made to protect them by field works against being hastily destroyed by raids.

The system of magazines has been modified by railways. Formerly the distance of the army from its base of supply was the most important element to be considered, but with railways the actual distance is not so important as the number of lines,—but railways being vulnerable they must not, of course, be exposed to any raids. A large portion of the supplies for the troops engaged in the siege of Paris had to come all the way from Prussia after they had exhausted the neighbouring country.

Forage and ration depots should be separate, but *every* article of the soldier's ration complete should be stored at one spot, and issued together from trains or magazines so that the loading of carts may be one operation, not many.

The points chosen on lines of railway for great magazines must depend on facility of issue; at great centres of commerce as a number of roads radiate from them, or important railway junctions, or where water and railway transport meet. Smaller establishments in connection with these great centres are formed for intermediate magazines, and these are also useful for gathering in supplies and utilizing the country around.

At great depots on lines of railway preparations have to be made for the entraining of troops, and to facilitate the operations of provisioning them and storing supplies, temporary stores and sheds, sidings and goods platforms must be extemporized according to the magnitude of the magazine and number of radiating lines. They become in fact "Etapen" stations under a regular commandant who commands all forces in his district. At these stations, too, temporary hospitals for sick in transit home are erected. Supplies are carried by rail from the large depots in rear to the railway depot near the army, whence they are distributed and issued to the troops by regular military transport.

The provision trains generally come within 2 days' march of the front; they are never allowed closer than one day's march, so as not to hamper the army.

The Prussians always endeavoured to have one intermediate magazine for each army corps which supplied that corps only.

On expeditions where the resources of the country are not to be counted upon, all the provisions have to be carried, as in the Russian Eastern Expeditions, the Red River, Ashantee, etc. At least 2 months' supply is always provided in such cases.

On ordinary occasions 6 or 8 days' supply is carried with the troops. Wellington, marching from the Coimbra to Douro, carried 3 days' with the men, and 3 days' in wagons, while a depot of 6 days' supply was formed at Coimbra. In Abyssinia, when marching from Lat on Magdala, 15 days' were carried, as it was expected this operation would take from 10 to 14 days. As the force advanced, provisions were, of course, being pushed on behind for the return journey. Here the great magazines were 30 to 35 miles apart. In 1859, 13 days' rations for 100,000 men were collected for the French before entering Piedmont, viz : 6 at Turin, 4 at Genoa, 4 at Alessandria, etc.

The Prussians have elaborated a very good system of supply. They carry 8 days' rations, as follows :

1 Day's ordinary rations, by the men, or partly by the men and partly by regimental carts.

3 Days' reserve rations carried by the men in their knapsacks. These are ordered on no account to be consumed without express orders from the army corps commander, and if consumed they are to be at once replaced.

4 Days' carried in the military provision wagons.

Besides this supply, the hired transport carries 7 days' forage, or partly forage and partly rations.

Frequently horses have to carry a reserve ration of oats and also of hay when forage is scarce.

The provision columns, when the army is on the march, are never to be unpacked or drawn upon when provisions are obtainable from other sources within reach of the regimental transport, unless, of course, the provision column contains perishable articles, such as baked bread.

Each Prussian army corps on a war footing has attached to it for purposes of supply :—

1st, 5 provision columns (proviant colonnen) each composed of 32 military four horse wagons (30 for provisions and 2 for their own baggage). These columns follow the troops everywhere and are charged with the immediate distribution to the troops. Each wagon carries $16\frac{1}{2}$ cwt., and, therefore, the column can carry 22 to 23,000 rations, including bacon and preserved meat,—not fresh meat as that walks. Allowing for absentees, the five columns will therefore carry 4 days provisions for the army corps. The commander

sometimes orders them to carry some forage in lieu of some of the full 4 days' rations. These columns may or may not be distributed to the divisions, this is determined by the General and depends on whether the divisions are together or not. When so distributed the army corps troops are attached for purposes of supply to one of the two divisions. When a battle takes place provision columns are always kept out of the tactical ground so as not to block roads, etc. On the three days' consecutive fighting which the Germans had before they drove the French back on Metz, their troops were closely concentrated and they had to bivouac on the fields of battle, they were consequently dependent on their three days' reserve rations, the provision columns not coming up till the 4th day (19th Aug.).

2nd, Five columns of "Fuhr Park Colonnen," each consisting of 80 wagons, generally drawn by 2 horses, hired, bought, or procured by requisition. These generally follow in rear of army corps or maintain connection with the magazines. They do not approach to the front nor distribute to the troops but keep the provision columns supplied, and they travel only on the best roads. Each wagon carries about 1 ton or 800 rations, and consequently the whole carry forage for 7 days or partly forage and partly provisions, as the commander may direct. These columns are much used for carrying forage; they never carry perishable articles, such as bread, but they do carry biscuit, bacon, etc. In the war of 1870 civilian drivers were employed in these hired transport columns. In future military drivers are to be used, thus saving the cavalry escort which used to accompany each column to keep it under control. Now a 6th "Fuhr Park Colonne" has been added. A bakery column is attached to each corps, and consists of from two to five wagons; it has charge of live cattle.

Further, in addition to these regularly organized means of transport, all local resources are made use of, as may be found necessary to maintain the line of stages when the distance of magazines becomes considerable,—every driver and vehicle being numbered.

A question arises with reference to the loading of the wagons of the military provision columns:—should each wagon be loaded with one kind of article or with so many complete rations? Experiments have been made with both systems, and it has been found that with one article only loading is easier and each wagon carries more; but in the issuing of provisions it has manifest disadvantages, as each wagon has to be drawn on to make up one ration; hence the latter method affords greater facility of issue and is, therefore, recommended for columns which have actually to distribute rations to the troops, while the other method of packing each wagon with only one article is recommended for all other transport.

SUPPLY OF CATTLE.—It is commonly found that cattle are more easily obtained and supplied than corn; they require no grinding nor baking and carry themselves, so that they can be brought in from a distance more readily, whereas transport is required for corn, and corn has often been plentiful at a distance but for want of transport it could not be brought up, and when obtained there have frequently been no means of grinding it. The supply of meat has therefore given commanders less anxiety than that of bread. In our wars cattle are generally bought by contract and shipped to our base in transport ships,—as in the Crimea, Turkish cattle were bought by contract and shipped at Varna. The Germans, after exhausting the supply by the system of requisitioning, draw their supplies of cattle by contract from their own country, contractors delivering to the Etapen Head-quarters.

The responsibility of supply for an army in the field lies with the general commanding, as he is responsible for the efficiency of his force in all its parts, and therefore also for supply. The Board which sat at Chelsea, London, England, to enquire into the cause of failure of supply in the Crimea, expressed the opinion that the General and not the Commissariat Department was responsible. The duty of the Commissariat Department lies in providing supplies, as to quantity and at the place of issue, according to the best of its ability and power, and according to the orders from the General commanding; but it is of course the duty of the Commissary-General to keep the General informed as to what supplies are in his possession, and to call his attention from time to time to expedien-
cies and methods of obtaining further supplies. The Commissary-General is held responsible for the advice he gives the General, but the General, whether he acts on that advice or not, is wholly responsible to the country.

CHAPTER XI.

MILITARY TRANSPORT.*

Among civilized nations in modern times, one of the principal difficulties which military commanders in the field have to encounter is the adequate supply of their armies with food and war material. In most instances it is not that supplies of either kind cannot be provided by the State, but that their conveyance to the spot at which they are to be consumed constitutes the real difficulty. Military History is full of examples of failure of every kind due to failure in transport.

The Duke of Wellington said that anyone could command a body of troops in a great battle, but there were very few who could feed them when it was over.

Both in Abyssinia and Ashantee abundance of supplies could be brought to the base of operations, but the provision and maintenance of the means of transport inland caused serious anxieties and delays.

Again, on a larger scale, England's maritime resources enabled her to convey to Balaclava almost all that was necessary for the Army before Sebastopol, yet the troops, only six miles distant, endured great privations for many months from want of adequate means for distributing supplies.

The general subject of military transport, omitting altogether transport by sea, which is a distinct subject, may conveniently be divided into:

- 1st. Inland water transport, that is, by means of navigable rivers, lakes, or canals.
- 2nd. Railway transport.
- 3rd. Transport by means of wheeled vehicles on ordinary roads.
- 4th. Transport by means of pack animals or human carriers.

*Compiled chiefly from a lecture delivered at the Royal United Service Institution by Lieut.-Colonel Clifford Parsons, Professor of Military Administration and Law, Staff College, England.

Of these, water transport is the easiest to provide and maintain under all ordinary circumstances where suitable inland water exists; it is also the most economical, and most suitable for heavy weights such as are involved when siege trains, their ammunition and other appliances, have to be transported. It is calculated that a horse can draw 25 times as much on a canal as on an ordinary road.

In former times, before the introduction of railroads, and even now in countries where railways are not available, the direction of navigable rivers had a considerable influence on the strategy of a campaign, as forming part of the line of supply. In the Peninsula, the Tagus and the Douro were thus utilized for considerable distances, and the Duke of Wellington made continual efforts in the course of the war to improve their navigation, for without them he could not have maintained his positions. At the outbreak of the Franco-German war the collection of supplies at the great Rhine fortresses and other places, to feed the enormous armies concentrating on that river, was mainly performed by steamers bringing provisions purchased in other countries, all the available railways being taken up by troops, so that no military transport could be brought up for some days. Inland water transport, however, has some disadvantages. In the first place, it is very easily interrupted. Should a small party of the enemy gain possession of any part of the water communication for a few hours, navigation may easily be rendered impossible for a considerable time. In a very short time the navigable channel of a river may be blocked by sinking a few laden vessels or barges, which it may take weeks to remove. Some of the locks, or part of the embankment of a canal may be destroyed by a few charges of powder, or it may be made useless by diverting the channels by which it is fed with water.

For military transport, railways are superior to canals in two or three important particulars,—their greater speed not only renders them far more efficient for purposes of supply during the continuance of operations; but also enables them to be used for the transport of the troops themselves in effecting their concentration at the outbreak of hostilities,—and this latter consideration is a very great advantage over water transport. In 1870, after the first concentration, the German troops were never moved by rail but always marched. Railways were used for bringing up reinforcements, supplies, sending the sick to the rear, etc.

Within reasonable limits, railways may be erected or extended either preparatory to or during the course of military undertakings. The first occasion on which this was put in practice was in the Crimea, where about 4 miles of railway were constructed from Balaclava to the army before Sebastopol for the transport both of food and siege material. In Abyssinia, about 11 miles of railway were

laid from the port of disembarkation in 4 months; and in the Franco-German war the Prussians constructed a loop line more than 22 miles in length in 5 weeks, from Remilly to Pont-à-Mousson, so as to turn the fortress of Metz which blocked the regular line. This loop line was invaluable in supplying the army besieging Paris till the fall of Metz.

From experience gained in Abyssinia it appears that the working of the line by a civilian staff proved very unsatisfactory, and it is recommended that in future all but engine drivers and foreman-platelayers should as far as possible be supplied from the army and navy.

Successful experiments have been carried on from time to time with different descriptions of light railway, as it by no means follows that the usual pattern need be adopted for military purposes. Thus by transporting to the base a moderate amount of material, a useful railway on a small scale might be constructed within a short time and be made available at an early stage of the operations, which is an essential feature in the utility of a railway under such circumstances.

Railways are equally vulnerable with canals, although it would under most circumstances be more easy to re-establish traffic on a damaged railway than on a damaged canal. Both these modes of transport have, however, the disadvantage of being confined to particular localities, so that no General could dispense with his ordinary military transport, because he could at some period of his operations make use of a railway or canal. Moreover, railways, even where they exist, cannot take the place of the ordinary military transport for the distribution of supplies to a large army;—first, because it is not considered expedient to carry railway transport too close to the sphere of action for fear of losing the supplies, which must necessarily accumulate at the terminal station, in the event of a retreat or even of a small retrograde movement becoming necessary; and secondly, because it would be impossible to find railways ramifying to all, or even to many, of the fractions of an army of any magnitude covering perhaps many miles of ground. About one day's march from the army itself is the nearest point to which railway transport should be used. Practically, then, the principal use to which railways are applied in war, after the forces are once concentrated, lies in replacing the long lines of wagons passing between the base of supply and the advanced magazines of the army; for this purpose, however, their importance can hardly be overrated when it is considered that a very ordinary goods train, say 30 trucks carrying on an average 8 tons each, conveys as much as 160 fully loaded 4 horse wagons carrying 30 cwt. each, and will transport the supplies to at least ten times the distance in the 24 hours, allowing

the widest margin for delays. Thus, as a minimum estimate, and without taking into account numberless other details which tend to augment the difference, a railway train may safely be said to be equal in transport power to 1,600 wagons with 6,400 horses and 3,200 drivers, not counting supervisors.

The military use of railways is a subject of so wide a scope that it will be dealt with in a subsequent chapter.

The relative merits of *draught* and *pack animal* transport have long been a matter of controversy. Up to quite recently the opinion was held in England that there was no means of transport so applicable to military operations as pack animals. This was due to the fact that, in the great wars of the early part of this century, British operations were chiefly confined to the Peninsula, a country exceptionally rugged and ill-provided with roads, and where commerce was mainly carried on by the use of pack animals. Other nations, guided by the light of their experiences of campaigning in Central Europe, upheld the use of wheeled carriages the superiority of which is unquestionable wherever the roads are sufficiently good to admit of their use. The effective wagon load being from 25 to 30 cwt., (3,360 lbs.), and the average load of a pack mule, exclusive of the pack saddle, about 160 lbs., it follows that a wagon carries as many rations as 20 or 21 pack mules; nor does this statement truly represent the economical difference between the two, as food for the animals themselves must in many instances be also carried; besides pack mules require more attendants whose rations have also to be transported. It is estimated that for transport purposes, in countries fairly flat and with ordinary roads, a horse can draw from 10 to 12 cwt. A simple example will best serve to illustrate the state of the case:—

Suppose 20 days' complete rations for 10,000 men have to be collected within ten days at an advanced depot three days' march from the base of supply, there being neither provisions nor corn procurable by the way. Each mule is to carry a load equivalent to 52 rations, or as nearly as possible 160 lbs., besides his own trappings. To effect this within the time allowed, 385 mules must deliver their loads at the advanced depot each day, and, as food for the animals and their attendants halting there for the night must also be carried, at 10 lbs. per mule, and 3 lbs. per man, 30 mules must be added for this purpose, making the number 415. Supposing A to be the base of supply, B and C the intermediate stages, and D the advanced depot, the calculation will be as follows:

	No. of Mules.
Halting every night at the advanced depot, D	415
At C there will be the following numbers every night:	
Returned from D, and ready to go forward again on the morrow.....	415
Arrived from B with supply for D	415
Arrived from B with corn and rations for the station C itself.....	63
Total halting every night at C.....	893
At B there will be the following:	
Returned from C and to start again on the morrow, 415 + 63	478
Arrived from A with supplies for D, and also for station C	478
Arrived from A with corn and rations for the station B itself.....	72
Total halting every night at B.....	1,028
At A there will be the number returned from B and ready for the morrow's journey.....	550
Total, without any allowance for casualties.....	2,886

A, B and C would be the head-quarters of each stage, and the allotment of animals would be,—to A (550×2) 1,100; to B (478×2) 956; to C (415×2) 830. Considerable numbers would have to be added as a reserve to meet emergencies, and to allow for the proper percentage of sick at least 25 per cent, of which as many as possible should be retained at the base of supply until required in order to save the transport of their forage, etc.

Now to compare this with the same operation performed by four horse wagons, each carrying, say, the moderate load of 25 cwt., or some 910 rations. Suppose all other arrangements to be the same, and the details calculated in a manner analogous to the last case, it will be found that 144 wagons with 576 horses, 50 wagons being allotted to A, 48 to B, and 46 to C, will perform the same work as the 2,886 mules, omitting all mention of the diminution in the number of attendants, the care of sick animals, and the difficulty of supervision. In addition to the foregoing considerations, pack animals undergo a great deal more fatigue than draught animals in performing their quota of work; each time a short halt takes place the draught animal experiences relief, whereas the other still bears his burden; and in cases where the baggage trains must be held in immediate readiness to move, pending the result of some tactical operation, the pack animal must remain loaded for hours as the loading cannot be hastily performed, for on the careful adjustment of the load depends the preservation of the animal's back and his general condition for work. The average percentage of sick among

animals performing transport work in a campaign, is estimated at 10 per cent for draught, and 15 per cent for pack transport, as the latter are so liable to sore backs. Moreover pack animals as a rule occupy a far greater space on the line of march, and require good training before they are useful as pack animals.

There is, on the other hand, a good deal to be said in favour of pack transport. In the first place, armies have very often to operate in countries impassable by wheeled carriages. This argument is, of course, conclusive for such instances, and, even where good roads exist, troops often get separated from them, and if the country is rugged, they can be reached only by pack animals. This must often be the case with individual battalions which may thus be deprived of access to their regimental reserves of ammunition and intrenching tools at critical moments. Again, it is urged in favour of pack animals that roads have frequently become blocked by carriages and the only method of bringing up supplies has been by pack transport.

It is, however, worthy of note, as applicable at least to operations in Central Europe, and therefore to other countries where the roads are good and country open, that the Germans do not admit that there is any necessity for providing pack animals, all their transport being by means of wheeled carriages.

A most important feature in pack transport is the pack saddle. A bad pack saddle will inevitably give the animals sore backs, when they become useless for considerable periods, during which, however, they necessarily require attendance, and other animals must in many instances be employed in bringing them their food. It is often found advisable to adhere to the saddle to which the animal is accustomed, and which has doubtless been found suitable to the country in which he has been obtained. This, however, cannot apply to the thousands of horses and mules purchased for an expedition from widely different sources, and arriving without any equipment at all at the base of operations. In the British Service there is an excellent pack saddle known as the Otago pattern; there are two sizes, one for large or medium, the other for smaller animals, weighing respectively $44\frac{1}{2}$ and $38\frac{1}{2}$ lbs. The saddle has a comfortable seat, upon which, when no other load is carried, a man can be mounted.

For purposes of calculation, pack loads, including the trappings which weigh about 40 lbs. say, may be estimated as follows:—horse, mule, or bullock, 200 lbs.; camel 400 to 450 lbs.; donkey 140 lbs.; elephant 15 cwt. to 1 ton. The horse, mule, pony, donkey, camel, and elephant are all good pack animals; the mule is better for pack transport than the horse, being more sure footed, more hardy, enduring, less liable to sore backs, and more easily fed as he will eat almost anything. The bullock is inferior in this respect and often breaks down, but then he may be eaten; as a draught animal, too, he is very

slow, from 2–2½ miles an hour, but whenever there is any sort of road, or track even, bullocks should be used in draught. Elephants have been found extremely useful in places where no roads exist for carrying heavy weights, such as guns and mortars, but they will not stand fire, consequently a train of bullocks to bring the guns into action must be provided in addition. The pace of an elephant is from 3 to 3½ miles an hour.

The camel, though slow (2 miles an hour), forms a very good pack animal, but those used on the plains are unsuitable for hilly country, for which special animals should be obtained. The camel is easily managed and fed when in health, but delicate and difficult to cure when once on the sick list. It has this one great advantage over other pack animals, that when a short halt takes place it can lie down under its load and obtain rest.

When transport has to be performed by human carriers, as was the case entirely in the Ashantee expedition, and partially in China in 1860, and expeditions in India, there are many points to be considered which do not enter into the question when animals are employed. The weaknesses, prejudices, and inclinations of human nature come prominently forward; four-footed animals may break down or even stray, if not properly looked after, but they cannot lay systematic plans to desert in order to avoid distasteful labour, or for fear of their employment leading them into danger. In Ashantee very large numbers were lost to the service by this means, and experience has shown that the indiscriminate mixing up of men of different tribes in the same companies or gangs does not answer. It has been found that the overseers of gangs must be selected, as far as possible, from the same tribe as the bulk of the carriers in order to be able to control them; and that the carriers showed less inclination to desert when they were worked on the stage system, so that they could, in many instances, return each night to their station which was frequently not far from their own villages.

The load for a carrier, both in China and Ashantee, was 50 lbs, but it did not always quite amount to that; in other expeditions it has been 40 lbs. As it is evident that a fixed weight must be determined upon, so that arrangements may be made for having the stores packed in corresponding quantities, there is much to be said in favour of the smaller load. In the first place, it is not excessive when a larger or more difficult march than usual has to be made, or when women or weakly men have to be employed; and in the next, the load is more capable of being adjusted to the requirements of the case. On short marches, easy roads, or in great emergencies, four loads may be given to three carriers, or even three loads to two carriers, the extra load being carried alternately,—or by any other arrangement suitable to the particular method of carrying adopted by the men.

It is found in practice that human transport is about as good, as far as forwarding supplies is concerned, as pack animals,—a man's food being less bulky than that of a mule.

In the recent Zulu war in South Africa a Zulu carrier corps was raised at the latter end of the campaign. This corps consisted of about 4 British officers, 3 interpreters, 20 indunas (headmen), and some 2,000 Zulus who had surrendered to the British as they advanced into the country. The regular transport, which had consisted of bullock wagons, had become so attenuated as to be utterly incapable of fulfilling the demands made upon it for the conveyance of food for the troops to the various stations on their return from Ulundi,—and this carrier corps made up for its deficiency. During the period this corps was embodied it carried 604,000 lbs. a total distance of 127 miles.

The next point for consideration is the description of wheeled carriages most suitable for general military transport. The qualities essential for a good military carriage are :—Interior capacity to receive, and strength sufficient to convey its load under difficult circumstances ; stability that it may not easily overturn on rugged roads ; lightness of draught ; facility of turning within a moderate compass ; durability ; simplicity of construction, so as to be easily repaired and easily packed for shipment ; and lastly, lightness of construction, as far as is consistent with the requirements just enumerated.

There have been endless controversies as to the relative merits of four-wheeled and two-wheeled vehicles. The principal merits ascribed to the two-wheeled cart with two horses are, that the horse draws to more advantage being closer to his load ; that it is easier driven and can be turned more readily than the wagon ; that it can go over worse ground and is more easily extricated from a difficulty ; that it carries at least as much in proportion to the horses employed ; that it is more simple in construction, and therefore more easily repaired ; and that it is more easily stowed on board ship. The chief advantages claimed for the four-wheeled wagon with four horses are,—that the animals suffer less wear and tear in doing their work, and that a less number of them are liable to sore backs ; that the wagon is easier to load, as less accuracy in distributing and balancing the weight is requisite ; that it takes up less room on the line of march with reference to the quantity carried ; that the loss or breakdown of one of its horses is of less importance, as it could proceed with three, while the cart with half its draught-power gone might be lost ; that they admit of a more mixed description of animals ; and lastly, that a less number of drivers are requisite.

The vehicles in general use in the country where an army is operating must always constitute a very considerable part

of its transport. It is utterly impossible to supply from the country more than that required as regular military transport accompanying the troops, and for the Divisional and Army Corps establishments of various kinds. The immense amount of transport to maintain the supplies along the line of communications must always consist of such vehicles and animals as can most easily be obtained by purchase, by hire, or by requisition, and must often be of a very miscellaneous kind. Sometimes, indeed, local transport is found superior in its own country to any other that can be supplied from a distance. This was the case in the Red River expedition, where the two-horsed wagons commonly in use throughout Western Canada were employed and stood the work over the extremely rough roads very well, while the two-wheeled carts provided for the occasion from England were found unsuitable.

The different descriptions of transport vehicles required for military purposes are very numerous, as almost every special service necessitates a specially-constructed wagon; thus in the Engineer service alone there are no less than nine descriptions of carriages employed—the pontoon wagon, the photographic wagon, the miners' wagon, the store wagon, the forge wagon, the tip-cart, etc. For the medical department there are—the ambulance wagon, the pharmacy wagon, the water cart, etc.

The wagon in most common use in the British service is that known as the General Service wagon, designed, as its name implies, for the conveyance of every description of stores and supplies for which special vehicles are not necessary. It gives a total interior space up to the bale hoops or cover, of about 120 or 130 cubic feet, and its full load is about 30 cwt. The weight of this wagon is nearly 18 cwt., and it can be easily fitted as a forge wagon. Thus the load drawn by each horse is about 12 cwt., and on average roads they can draw this at the rate of 23 or 24 miles a day.

On service, and when fully loaded, this wagon is drawn by four horses on the shaft principle, each of the near horses being ridden by a driver, as in almost all English military carriages. A set of reins is, however, provided for driving from the box, for use when this method is considered expedient. In the opinion of many, this mode of driving should be resorted to when travelling on good roads, as a saving to the horses and a prevention to sore backs, but it is generally admitted that for transport that must necessarily accompany troops, be the roads good or bad, the postillion fashion should be maintained, as by it difficulties are surmounted which would be insuperable to wagons driven from the box.

The small arm ammunition cart weighs empty $8\frac{1}{2}$ cwt. It has 8 compartments, taking two boxes of ammunition each. As each box holds 600 rounds of Martini Henry, it carries 9,600 rounds,—weight full 19 cwt.

With reference to draught power for transport purposes, the time has come when the traction-engine must be reckoned as one of the auxiliaries. In Italy traction-engines form part of the military transport, the long level roads of northern Italy being favourable for the purpose. It appears that the latest patterns are engines of about six horse-power, able to draw about ten four-horse wagons on a moderate road at an average speed of three miles an hour. The engine is fitted underneath with a windlass and coils of strong chain or wire-rope, from 80 to 100 metres long, by means of which it is able to extricate wagons or heavy guns out of difficulties, and even, by making fast the end of the chain, to surmount steep and rugged pieces of road by the simple process of winding itself up by successive stages. Traction engines must of necessity be confined to the best roads, as they would very speedily destroy any road with a light foundation; there is, moreover, considerable difficulty and delay in causing an engine with its train of wagons to turn sharp angles where one road joins another, so that their utility is much restricted.

The organization of military transport must now be considered.

It is a well recognized principle, founded on past experiences, that the transport service with an army, to be efficient, must have a military organization. The adoption of this principle has gradually brought about the division of transport into three classes, viz., *regimental*, *departmental*, and *general* transport.

In all transport organizations two main requirements have to be considered,—first, that which has to accompany the troops such as regimental and departmental transport, which must be military transport; and second, general transport for the maintenance of supplies along the trunk line connecting an army with its base.

The *regimental* transport is that which is placed entirely under the management and control of the commander of the battalion, or other unit, for the purpose of meeting its immediate wants; subject to the contingency that, when this transport is not actually required for marching purposes, it may be made available for services of a general kind, either wholly or in part, as may be deemed expedient by the commander of the brigade, division, or army corps.

A British battalion on its war footing has twelve transport carriages, as follows:—

- 1 wagon for staff baggage, office books, etc.
- 1 wagon for Quarter-master's stores.
- 2 wagons for provisions carrying at least one day's rations.
- 4 company wagons, one for every two companies, carrying officers' baggage, cooking utensils, blankets, etc.
- 3 small arm ammunition carts carrying 30 rounds per rifle.

1 cart for intrenching tools carrying 300 picks and shovels.

Thus there are 8 wagons and 4 carts with 40 horses.

If tents are carried 3 wagons will be required in addition in second line.

A cavalry regiment has 10 carriages, as follows :

1 wagon for staff baggage, books, etc.

1 wagon for Quarter-master's stores.

4 squadron wagons.

1 forge wagon.

2 provision wagons.

1 small arm ammunition cart.

If tents are carried 4 additional wagons are required which can also carry horse blankets.

A Battery of Artillery has 4 carriages in addition to its guns and their ammunition wagons, viz.:

2 wagons for baggage, books and stores.

1 forge wagon.

1 provision wagon.

The battalion furnishes out of its own ranks, the officer, sergeant, and 22 drivers required for its regimental transport, the men receiving some previous training. The horses are supplied by the Commissariat and Transport Department, the wagons and other material by the Ordnance Store Department.

The Russo-Turkish war of 1877-78 has shown clearly that in rugged countries with but few bad roads, wheeled regimental transport is not suitable for ammunition and intrenching tools, as these desiderata cannot under such conditions be supplied to troops in action. It is therefore advocated that a first regimental reserve of ammunition on pack animals should follow the troops into action ; —and, should intrenching tools not be carried by the troops themselves, a few additional pack animals with a proportion of these stores. In European armies, however, a proportion of the men carry their own intrenching tools, a system which many desire to see adopted in the British service.

Departmental Transport includes all transport, other than regimental, that forms part of the establishment of the brigade, division, or army corps in the field, and that marches, encamps and works in connection with the unit to which it belongs.

In the British service transport is under the "Commissariat and Transport" Department. Many officers, however, advocate the establishment of a separate department for transport, chiefly on the

grounds that in peace time commissariat officers receive little training in duties relating to transport, and that during a war the Commissariat have enough to do to feed the army. On the other hand many are unfavourable to the principle of separation, especially since by the recent reorganization of this Department combatant officers are to be posted to it.

One of the greatest difficulties to be overcome in war is the supply of an army with provisions and forage during a continuous march in an enemy's country, and to form an idea of the work required from Commissariat officers under these conditions, Sir F. Roberts' march from Cabul to Candahar may be taken as an illustration. This force consisted approximately of 2,800 Europeans, 7,000 native troops, 8,000 followers, 2,000 horses, 750 artillery mules and some 1,500 transport animals, so that marching on one road the length of column must have been about 7 miles.

Now allowing the usual field ration to the British troops, and also to the native troops and followers whose rations weigh nearly as much, this force, if on full rations, required a daily supply in round numbers of 2,900 lbs. of meat, say, 70 country sheep, 900 four pound loaves or 25 cwt. of biscuit, 710 lbs. rice, 530 lbs. sugar, 133 lbs. of tea, 750 lbs. salt, 1,800 lbs. of vegetables, 90 gallons of rum, 14 tons of wheaten flour, $1\frac{1}{4}$ tons dhall (a kind of pea), 1,400 lbs. ghee (fat) 12 tons of corn, and 18 tons of grass. It will be seen from these figures that feeding an army every day is a work of considerable magnitude. The usual load for a mule or pony is 160 lbs. To carry, therefore, the above European supplies of tea, sugar, salt and rum, alone, for 30 days would require 430 mules or ponies.

To obtain the tons of flour, corn, grass etc., required for each day's consumption takes no little time even when there is nothing to do but draw the articles from a commissariat depot in which there is an abundance ready stored, but when they have to be obtained from a transport train which follows an army, and which is itself supplied from the base of operations, or the country in rear, the labour is very much increased. In the case under consideration, however, the country in rear of the army was no longer open, and this fact increased the difficulties of supply enormously, as the above supplies had to be obtained by a system of foraging.

In England, that portion of the Army Service Corps which belongs to the commissariat and transport department is organized in 16 companies on the peace establishment. Each company has a sufficient cadre to admit of its division into two parts, each part by augmentation to become a complete company, so that on mobilization 32 companies in all can be produced, and each company is further subdivided into four sections.

The departmental transport of an Army Corps absorbs 8 Army Service Corps companies, each company being divided into 4 sections of about 11 wagons each.

For the first line of transport 4 companies are required, one for each Division, and one for the Corps Staff and all details not belonging to Divisions such as Cavalry Brigade, Corps Artillery, &c.

The Company allotted to each Division is distributed by sections,—one section to each Brigade, one for the divisional staff and divisional troops (cavalry, rifle battalion, artillery, engineers, &c.), and the remaining section furnishes transport for the divisional bearer company. Besides carrying the baggage of the butchery implements, staff, commissariat and transport detachment, military police, etc., these companies also carry one day's rations with corn.

The second line, like the first, is also distributed separately, viz., that required for each division, and that for the army-corps details not belonging to divisions. It provides transport for the divisional field hospitals (two per division), and for three out of the six movable field hospitals on the corps establishment, it being considered that this number is the greatest that can need removal at any one time. It carries an additional day's rations and corn, both for the divisions and corps details, and furnishes transport for the field bakery and butchery column as well as for the ordnance store department of the corps. In this manner three more companies are absorbed; the eighth company being held in reserve for such purposes as circumstances may dictate. It could carry, if necessary, tent equipment for about three-fourths of the army corps, or, a far more probable use in a great campaign when a line of communications is established, it might be withdrawn from the departmental transport of the Army Corps, and be employed in connection with the advanced depot.

On the war establishment, neither the companies nor the sections have a uniform strength; it being wisely determined that, within reasonable limits, the strength of the company or section shall correspond to the work that is required of it, and work together as a whole; any other plan would necessitate the breaking up of companies into fractions working apart from each other, a radical defect in any military organization. The companies range from 182 of all ranks with 83 carriages, to 230 of all ranks, with 127 carriages.

The usual data upon which calculations as to the length of road occupied on the march by regimental or departmental transport are based, are as follows:—Including an interval of 4 yards from the tail board of one carriage to the horse's head of the succeeding one, each vehicle with two horses abreast may be estimated as occupying a length of 12 yards,—to which 4 yards must be added for every additional pair of horses abreast. A pack horse or mule is allowed a minimum of 4 yards in length, the breadth must depend upon the mode of loading, but it could hardly be less than 8 or 9 feet, so as to avoid collision. For strings of camels 5 yards per camel should be allowed. Thus, taking the division as practically the marching unit, its troops, accompanied only by such portions of its transport

as must be at hand for an action, including half its reserve ammunition column and its bearer company, and allowing one-third for lengthening out, would occupy 4 miles of road, while the rest of its transport, following as might be found expedient, would occupy $2\frac{1}{2}$ miles more, making the whole about $6\frac{1}{2}$ miles.

For an Army Corps the total wheeled transport, except actual guns, occupies $17\frac{3}{8}$ miles allowing one-third for lengthening out,—its total length being about $25\frac{1}{2}$ miles.

The length of road occupied is very considerably increased when pack-transport has to be substituted for wheeled carriages, and depends so materially on the number of animals that can march abreast upon the road, that it is useless to attempt to frame an estimate for general application. It is, moreover, found that both pack animals and human carriers open out very much on the march, and are much more difficult to confine within anything like reasonable limits as to road space, than are wheeled vehicles.

The *General Transport* of an Army.

The British regulations for the organization of the line of communications of an army in the field, divide, for purposes of command and administration, the area existing between the rear of the fighting force and the base of operations into three sections, viz.: the base itself; the road or roads; the advanced depot; each under a commandant aided by a staff representing all the departments of the army whose functions connect them with these sections respectively. Over the whole of this system is placed a general officer called "The Inspector General of the line of communications," whose authority is paramount over all troops and others employed in, or passing through, this area, and over all the military departments working therein, and who is responsible for every transaction connected with the service of the army in front which takes place between the base and the advanced depot, both inclusive. The *general transport* of the army is the transport, whether military, hired, requisitioned, or purchased, which is brought into military use within this area, not, however, including the railway service, the control of which, though under the direct authority of the Inspector-General of the line of communications, is specially provided for. It is this general transport which, either in the absence of railways or as supplementary to them, pushes forward supplies to the advanced depot within tangible reach of the army departmental transport; and it is this transport, almost always composed of heterogeneous elements, brought together often from different parts of the world and with a *personnel* speaking various languages, that commonly presents the greatest difficulty in organizing for the effective service of the line. New organizations are always necessary and the material obtainable must be utilized. Vehicles, harness, workshops, and other appliances have to be provided on a large scale, as also depots both for spare animals and for the reception of those sick or disabled.

In India this general transport is, as a rule, composed of bullock carts and pack transport by mules, camels, or bullocks. In South Africa it generally consists of the heavy wagon of the country carrying a load of about 5 tons and drawn by 16 oxen.

With reference to the organization necessary for the general transport, the following data may be acted upon:—first in the case of wheeled transport. Every driver, whether military or civilian, can take charge of one pair of horses or mules as a minimum and of two pair as a maximum, both on the road and in camp, the maximum to be only for emergencies of short duration. Draught bullocks do not require so much attendance, as in South Africa two men are in charge of the 16 bullocks belonging to a wagon. A supervisor can look after from 5 to 10 wagons or carts, according to the number of men and animals belonging to them, and to the material available. Thus a sergeant or a corporal can supervise five 4 horse wagons of the strictly military type, while a supervisor has been found sufficient for every ten 2-horse carts with civilian drivers.

In the Afghan war transport consisted to a great extent of carts drawn by a pair of bullocks, the load for each cart was about 800 lbs. Each cart had one attendant, and for every 100 carts there was one first-class inspector, two second-class inspectors and 6 overseers.

In this war camels were also largely used. They were told off in strings of four under the charge of one attendant. The four animals in string cover a distance of about 15 yards. When camels are properly looked after and fed they are the cheapest of all pack animals. Four good camels, with one attendant, will carry as much as 9 mules with three attendants, and will eat considerably less.

Wheeled transport for the general transport services should be divided into units the strength of which should be determined by the number of animals rather than by the number and description of vehicles, as the carrying power must necessarily be fairly proportionate to the draught, the effective load for such transport on fair roads probably averaging about 10 or 12 cwt. per horse or mule.

Every 1,000 animals might be divided into 4 companies of 250 each, having a field officer in charge of the whole, with an adjutant, quarter-master and veterinary surgeon, a farrier major, a wheeler major and a saddler major. Each company would require two commissioned officers and two warrant officers (conductors), 22 N.C. officers and 142 drivers including a proportion of saddlers, harness-makers, wheelers, farriers, etc.

For pack transport a similar establishment would be provided for each company of 250 animals without the proportion of wheelers. It is considered prudent at the outset to provide one muleteer to every two mules, as the number of muleteers would probably soon be diminished by casualties, while the number of animals must be maintained from the reserves, otherwise the work allotted to

each company could not be performed,—but under ordinary circumstances one attendant is sufficient for every three pack mules or horses.

It is a fatal mistake to over-estimate the powers of transport, and thus afford inducements to subordinates to overload their animals, in order to fulfil the expectations of their superiors. Assuming, therefore, that three-fourths of its strength can be relied upon for actual work every day, a fair and moderate assumption, the data for calculations would be that a company of pack-transport of the foregoing type could carry an effective load of about 13 tons, and a company of draught-transport about 70 tons.

For the organization of human carriers, a supervisor for every 25 carriers is sufficient, four such sections making a company of 100, which may be commanded by a selected N.C. officer. The combination of companies into larger units must greatly depend upon the conditions under which they are to work.

In any organization, however, whatever its character, required to work along an extended length of road, there must be arrangements to provide for a strict supervision, exercised by Inspectors of superior rank allotted to definite sections of road, and constantly on the move thereon, so that they may actually witness the working of every part of their charge at frequent and uncertain periods.

In organizing a system of transport one of the first points to be determined must necessarily be the system upon which it is intended to work the transport,—that is, whether the wagons, pack animals or carriers are to be worked by stages, returning to their own stations after performing a stage; or whether convoys are to be carried through several marches, only returning after an interval perhaps of many days. The experiences of all recent expeditions are in favour of the stage system which was employed in Abyssinia, Ashantee, and Afghanistan.

In working transport on the stage system there are several obvious advantages; at least each alternate day every man, animal, and article of equipment comes under the eye of the officer in charge of the station to which they belong, and can, therefore, be more easily kept in a state of efficiency. The unremunerative weights are less, as only a very small portion of the kits of the drivers and others need be taken with them, and the responsibility for the condition of the component parts of the system, as well as for the work actually done on each stage, is easily fixed. When through two or more contiguous stages vehicles of nearly the same type are used, so that the mode of attaching the draught animals does not materially differ, the vehicles themselves may advantageously be sent through that part of the line instead of being unloaded at each stage, the drivers with the animals and harness returning to their station with the empty vehicles.

Whether or not it may be advisable to make arrangements by which each convoy should be able to return to its station the same night, must depend upon the particular circumstances of each case. This might, of course, be effected either by increasing the number of stations and making the day's progress of the stores cover two stages, or by causing intermediate stations to send half their carriages forwards laden, and half backwards unladen, meeting those of the adjacent stations midway. The advantages of returning home each night are considerable; the average daily stages, when the transport returns the next day unladen, can hardly exceed 20 miles, probably 18 would be a safer estimate; whereas by equalizing each day's work, half being performed laden and half unladen, probably 11 to 12 miles each way might be accomplished with the same wear upon the animals; there would thus be a gain in the day's progress, in addition to the immense advantage of every man and animal sleeping each night at his own station. On the other hand, this plan has the serious disadvantage, either of largely increasing the number of stations, and entailing the inconveniences of numerous separate establishments, or of involving complex arrangements for meeting and transferring stores midway; and it is probably on account of these drawbacks that the single stage system is more often adopted.

CHAPTER XII.

RAILWAYS.

In war railways have two most important uses, viz.:—Mobilization and concentration at the opening of a campaign, and supply during a campaign.

They have, however, many further uses, as for instance transferring fractions of an army from a distant point, bringing up reinforcements rapidly at critical times, enlarging the area from which supplies may be drawn, removing sick, wounded and prisoners.

The true value of railways lies in *economy*—economy of time and physical labour in concentration of armies, and accumulation and transport of stores; economy of life in disencumbering armies of sick and wounded, and distributing them.

Railways facilitate the first operations of the assailant enabling him to make more sudden concentrations, and the defender is still kept in doubt as to whether it is a real attack or a feint. But if the defender be forced to retreat he can use his railways destroying the lines as he quits them and the assailant has either to repair them or use ordinary roads. Other things being equal, an invader should direct his attack on a part of the theatre of war where railways exercise small influence since their effect is on the whole favourable to the defender.

They do not supersede marches along the regular roads after mobilization and concentration have once been effected, as, for one thing, an army advancing can never trust to railways within the sphere of the enemy's operations. It is only in an inconsiderable degree, and for partial movements, that railways can with confidence be resorted to when the opposing forces are so near that collision becomes imminent. In July 1870, some Prussian Hussars blew up a railway viaduct which connected different parts of the French army (Bitsch-Reichshofen), and it was partly due to this cause that MacMahon did not receive at Worth the support on which he relied.

The movements of troops are now much accelerated by the use of railways which enable armies in the field to be properly and regularly supplied, and their movements are not, as of yore, or in countries where no railways exist (Zululand), so frequently delayed for want of supplies.

In the wars of 1859, 1866 and 1870, after the first concentrations were effected all extensive movements of troops were performed by marches on roads. As long marches fatigue Infantry most, and they are most easily entrained, it is often advantageous to send the Infantry by train only—while the Cavalry, Artillery and Trains march.

Illustrations of the Use of Railways for Concentration.

FRENCH CONCENTRATION IN 1859.—In 10 days 75,000 men and 5,000 horses were conveyed from Paris to Marseilles.—Estimated march time 50 to 60 days.

In 1866, the 8th Prussian Corps (31,500 men, 8,500 horses), was conveyed from the Rhine to Saxony, 250 miles, in 7 days.

The same year the Austrians brought up men from Italy at the average rate of 12,000 men and 1,000 horses per day,—120,000 men being brought up in 10 days a distance of 350 miles.

After 1866 the Prussians revised their railway organization. Schemes of concentration were kept constantly prepared, time tables were ready and corrected up to the latest extension of lines,—so that when the war with France broke out in 1870 they were enabled to concentrate their enormous army in an incredibly short space of time by the use of 9 distinct lines of railway leading from the interior of Germany to the Rhine. Their Army Corps were completely mobilized on the 16th day after mobilization began, and concentrated on the frontier 10 days after that.

INFLUENCE ON SUPPLY.—The enormous transport trains which formerly passed between an army and its base may now to a great extent be dispensed with, and the connection will be maintained with greater speed and certainty, the loss and damage of supplies much reduced, the number of reserve and intermediate depots lessened, the transport and number of men so employed enormously diminished. An immensely increased area will generally be available for supplies, and particular districts need not be exhausted. Great magazines at the junction of important lines will be established with ease, and army transport in the form of horses and vehicles will be confined to the space between the depots on railways and the front of the army.

The sick and wounded removed with ease and regularity will no longer encumber the movements of an army.

employing railways as a means of supply method and regularity in loading and unloading trains is principally requisite. There

is a danger of supply trains not being *immediately* unloaded at the terminal station, and so accumulating and causing a block; this is to be specially guarded against.

One railway running 12 to 14 trains a day fed the German armies numbering about 200,000 men round Paris, brought up Artillery and siege material, and reinforcements averaging from 2,000 to 3,000 men a day, at a time when the resources of the country had ceased to contribute to their support in any material degree.

It was then estimated that a train load of 246 tons will carry two days' rations and corn for one German Army Corps, including its Cavalry Division, a total of about 37,000 men and 10,000 horses.

The gain afforded by railways in the actual movement of troops increases in proportion as numbers are great and distances small. Thus a battalion or brigade might cover two months' march in one day; but a large force moving over a short distance would take longer by rail than march. The Prussians calculate that to gain time the proportion of troops to distance must not exceed 400 men to a mile.

The influence of railways is well exemplified in Sherman's campaign in Georgia in 1864, as the aid he derived from his railway was very important. He was operating in a country where the obstacles were numerous and the roads bad; and he was linked to his base by a single line of railway, conquered bit by bit from the enemy, who frequently broke it in retreating. "This main road," he says in his report, "has been admirably managed, and has supplied this vast army (100,000 men) so that not a man, horse, or mule, has been for a day without food, and with abundant supplies of clothing and ammunition." Not only was the daily supply kept up, but provisions for several weeks were stored at important points of the communications; and throughout the campaign the cavalry on both sides were extensively employed in enterprises against this railway, as the most effectual means of damaging the enemy.

Railway Organization.

The work on a railway may be divided into two classes:—

1. *Administrative*, corresponding to the duties of Traffic Manager, comprising—general administration of the line or system of lines, distribution of rolling stock, combination of movements on different lines, choice of sites for main stations, temporary platforms, etc.

2. *Executive*, corresponding to the duties of Station Master, comprising—superintendence of station, loading and unloading of trains, forwarding men and goods, etc.

A good system of Military Railway Organization is of immense importance to continental powers, as the success of any war depends largely upon the power of rapid concentration. In 1878 Regulations

for the Organization of the Line of Communications of an Army in the Field were issued by the English War Office,—but no staff exists nor are any officers or men trained to the duties they would have to fulfil in war.

It is true in England there is an "Engineer and Railway Volunteer Staff Corps" formed of Chief Engineers and Traffic Managers of great lines, who meet occasionally in peace time to discuss questions connected with the military use of railways. In time of war they would form a committee acting directly under the military authorities, and would receive from them the general plan of concentration, number of troops to be moved, points of departure and arrival, etc. The committee would then work out the necessary railway arrangements, amount of rolling stock required, distribution, number and succession of trains, etc. Thus lines would remain under their own experienced staff, who in turn act directly under the military authorities.

It may be remarked that in England, as elsewhere, the Government is at liberty to take from a railway company, either the whole or any portion of its lines for military purposes. If this were done, the regular railway staff as it exists would also have to be taken over, as it would be impossible for military officers to set up on a sudden proper working arrangements.

A great concentration, such as the Prussian in 1870, is the most complex of all railway operations, but it can generally be prepared beforehand.

Points to be considered in preparing a scheme :—

1. Rolling stock—amount required, necessary arrangements for its collection—its capabilities, how far different lines can meet demands, etc.
2. Distribution of operations, so as to employ all lines equally as far as possible, and leave none idle.
3. Extent to which ordinary traffic is to be suspended.
4. Rate of travelling and stoppages, times occupied in loading and unloading and intervals between trains.
5. Selection of halting places and stations for entraining and detraining and also the provision of suitable accommodation. This is especially important at termini,—trains crowd in and a block ensues unless unloaded at once.

Difficulties to be considered : Break of gauge—junctions where trains cannot run through—different systems of signalling.

With reference to the number of trains that can be sent in one day the Prussian official instructions put 12 trains on a single and 18 on a double line as the maximum to be sent in the 24 hours—this was exceeded in the war of 1870. The French then ran from

20 to 25 trains in the same time. It would be absurd to apply this to England, where it is estimated that trains could be run every 5 minutes, or 8 trains an hour could be counted on.

To run trains at this rate, troops would have to be entrained at many different stations,—and in England the considerations which would limit the number of trains would be the power of the military to entrain troops and the quantity of rolling stock available. Infantry can be entrained anywhere, but horses, wagons, stores, etc., require a great deal of preparation, suitable platforms, etc.

However, the rapidity with which a corps can be entrained is chiefly a question of amount of station accommodation and facilities, and also of the number of approaches to the station. At a large station, where space is considerable and preparations could be made beforehand and at least one day's notice given to collect the rolling stock, the maximum that can be sent off is 4 trains per hour, and if kept up at that rate it would be very satisfactory, provided equal facilities for detraining are provided at the terminal station, *i.e.*, troops must be detrained as quickly as they are entrained or the line will be blocked. Some, however, maintain that a time distance of at least 20 minutes should be allowed between the trains—this would give only 3 trains an hour. Moreover, it is seldom possible to completely stop all ordinary traffic even under pressure of war, as postal services must be attended to, and large cities are so completely dependent on the provinces for food, that to entirely stop the ordinary traffic would be virtually to starve their inhabitants,—so that a certain number of trains a day must be allotted for these purposes, and further, as the pressure of running so many trains is great on the railway officials, it has been found necessary to give a railway terminus a rest of two days after two weeks continuous work. This is also necessary for repairs.

It is on no account recommended to use both lines of rail, on a double line, in one direction at the same time. It is not desirable, because rarely can sufficient rolling stock be collected at a time for large bodies, and consequently the second line must be used for return empties. Also it is not necessary, as trains can be used on one line as quickly as Infantry can be packed into them, and quicker than Cavalry or Artillery.

On the American continent most railways have but a single line, and the rapidity with which troops can be conveyed is greatly affected thereby. The fewer the places where trains can pass one another on such single lines, the fewer will necessarily be the number of trains that can be at work at the same time upon every 100 miles of road. The number of trains actually running in each direction at the same time upon any line will be equal to the number of intermediate crossing places not counting the termini at each end, and the intervals between the departure of trains cannot be less than the time a train will take in running between the two crossing

places that are farthest apart on the line. When, therefore, a railway with a single line is to be used for the transport of a large body of troops, and subsequently as a line of supply, additional crossing places should if possible be constructed.

It is estimated that :—

An Infantry Battalion on a war footing with its Regimental Transport can be entrained in 40 minutes and detrained in 20 minutes.

A Regiment of Cavalry or Battery of Artillery can be entrained in one hour and detrained in 30 minutes.

A heavy train carrying stores and provisions can be loaded in 1 hour and 20 minutes and unloaded in about the same time.

Rate of Travelling :—

The Prussian rate is from 15-18 miles an hour	} including minor halts.
“ French “ 16-20 “	
“ English “ 20-25 “	

Generally a short halt of about 15 minutes is allowed after 2 or 3 hours, and a long one of 1 or 2 hours after every eight (8) hours, for refreshment. In long operations an occasional break of a day is required to reorganize.

It is often desirable that one or more days' rations should accompany the troops,—it is generally recommended that forage for horses should be taken ; but when practicable meals should be provided ready at halting places. In any case water for the men and horses must be provided at different stations along the line.

Requirements of Railway Stations.

A station to be adapted to military operations on a considerable scale, requires :—

(1.) Abundant platform accommodation, as regularity and expedition depends very largely on platform accommodation. If there be only one platform, the rate of despatch of trains is regulated by the time taken in loading, and if the platform is not long enough to take the whole train the time in loading or unloading is doubled. Sufficient accommodation is seldom to be found on the spot and temporary platforms have therefore to be erected. For the movement of any considerable force there should be sufficient to load three military trains simultaneously, besides commissariat trains. As stations will seldom be provided with sufficient, it is desirable that there should be a suitable place near for the erection of temporary ones, and consequently a station on an embankment or in a deep cutting is unsuitable. There should also be free communication to the platforms.

(2.) Abundant sidings, as a considerable quantity of rolling stock may have to be collected, and commissariat trains take nearly $1\frac{1}{2}$ hours to load, and traffic is liable to become blocked.

(3.) Available ground for forming-up troops outside, and suitable sites near for encamping and packing carts and wagons.

(4.) Sheds and stores for supplies, etc., as large stations necessarily become depots.

(5.) Sheds for refreshment of troops with sufficient cooking arrangements.

(6.) A hospital is desirable.

(7.) Sufficient water supply, both for passing horses and troops, and for engine. An engine drawing a heavy train consumes about 100 cubic feet, or 660 gallons of water per hour.

(8.) Fuel.—An engine consumes about 8 cwt. of pit coal per hour. The method of entraining horses, guns and wagons has to be considered. In Prussia, the Government compels railway companies to construct a certain number of trucks with their ends made to let down, so that they make a continuous platform. A ramp is laid against the last one up which horses can walk, guns are drawn up and wheeled from truck to truck, so that the whole train can be easily loaded. With trucks in which the ends do not let down side loading must be resorted to.

A good kind of moveable platform was adopted in Canada when a long frontier had to be guarded by a small force from Fenian raids, and for this purpose it was necessary to send the troops quickly to any point in trains. For horses, a skid 3 feet 6 inches broad and 14 feet long with moveable rails was used, pieces being nailed across to prevent horses slipping. To take a gun, 3 planks of oak each 14 feet long, 3 inches thick and 11 or 12 inches broad, were provided. One took the trail the other two the wheels. At one of the ends a little iron hook was fixed to hook on to the side of a truck to keep it in place. With this plan a gun was detrained, limbered up, run up an embankment by hand, loaded and fired in 4 minutes.

Station platforms should be about 20 feet wide and have ramps at both ends. With regard to their length—platforms where horses or wagons have to be embarked should be as long as the train so that each car can be loaded simultaneously. If for Infantry, the platform need only be of the length necessary to embark horses and regimental transport.

In computing the number of soldiers, armed and equipped, that can be conveyed in a railway carriage the usual allowance is 8 soldiers to 10 ordinary passengers.

On the American continent a first-class car carries 60 passengers, the other passenger cars generally 40,—so that these could carry 48 and 32 soldiers respectively. A box car carries 9 tons of freight, or 10 horses with harness on,—or 9 Cavalry horses saddled with equipment on the saddle.

A cattle car will carry the same number of horses. A platform car or flat (29 feet long by 9 feet wide) will carry a field gun with its limber, together with an ammunition wagon with its limber,—or 5 one-horse carts, or 3 ordinary farmer's wagons.

A train consists of from 10 to 15 passenger cars travelling at the rate of from 16 to 22 miles an hour, or from 16 to 22 freight cars travelling at the rate of from 12 to 15 miles an hour.

CHAPTER XIII.

ARRANGEMENTS FOR PROTECTING AND MAINTAINING THE LINE OF COMMUNICATIONS OF AN ARMY IN THE FIELD.

It is absolutely essential that the line of communications between an army and its base should be secure and well organized, and very desirable that the Commander-in-Chief should not be troubled about it nor have to deduct a portion of his active force for its defence, hence in 1878 the War Office in England published elaborate, clear and sound "Regulations for the Organisation of the Line of Communications of an Army in the Field," based on the Prussian Etapen system.

In the introduction to these Regulations it is laid down that "when an army operates in the field it is of paramount importance that the troops in front should not have to furnish detachments to guard and maintain the lines of communication." Consequently it has been decided, "that a separate and distinct organisation for the line of communications shall exist in the field." At the head of this organisation is to be placed a general officer who will be styled "The Inspector General of the Line of Communications." He is to be responsible for everything in rear of and including the Advanced Depot. As it would be impossible for one officer to do more than exercise a general supervision over a zone of country, perhaps 150 miles long by 30 miles broad, sometimes even of greater area, and containing in many instances two or three roads and several railways, as well as a large body of troops and numerous establishments of different descriptions, he is given, not only a large staff, but likewise three lieutenants of the rank of Colonel or Brigadier-General in charge respectively of the Base of Operations, the Communications and the Advanced Depot. Each of these lieutenants will also be assisted by a numerous staff comprising representatives of all arms and departments.

The officer commanding the base of operations has for his functions :

1. The general superintendence and police of all the troops at the base of operations.

2. The embarkation and disembarkation of all men, horses and stores.
3. The maintenance of all wharves, piers, storehouses, etc.
4. Arrangements for receiving all sick and wounded from the front.
5. Communicating with the naval authorities.
6. The defence and security of the base of operations.

It being assumed that the base is a seaport, as of course it must be with a British force, it becomes necessary to define the duties of such portion of the navy as may be stationed there, especially as in the Crimea a certain conflict and confusion of authority arose between the Navy and the Quarter-Master-General's Department. It is now laid down that the navy unload and disembark all men, horses and stores, provide the requisite boats, tugs, etc. The loads are delivered into the hands of the army at high-water mark, or at the appointed wharves or piers, and the army there unloads the boats, etc. The army loads all boats or barges under the supervision of a naval officer. Once loaded, the boats and barges come under the responsibility of the naval authorities. Though the above is the rule, the Army and Navy are to afford each other mutual assistance when needed.

The Road Commandant assisted by 12 staff officers and a Provost Marshal will have to improve and keep in repair existing roads, bridges, etc., and make any additional ones that may be necessary. He will also guard and preserve order along the communications, will transport to the front or rear all men, horses, stores, etc., confided to his charge, and will obtain means of transport, food and forage, employing requisitions if necessary. If the native civil authorities do not quit the district he will communicate with them. If they quit their posts, he will attend to the civil organisation and administration of the district until new ones are installed. The officer commanding the Advanced Depot will be responsible that all requisitions from the front are promptly met, will fill up and forward to the front without delay all departmental transport, and supply the commissariat and store officers with such working and fatigue parties as may be needed for loading and unloading stores.

To guard against raids by small bodies of the enemy on the line of communications, or by bands of peasants, the Inspector-General of Communications and his subordinate the Road Commandant, have a certain force placed under their orders. As a long line may have to be guarded and detachments may at any moment be attacked by a force numerically superior and possessing local knowledge, the Etapen troops should be of the best quality and not militia or volunteers.

The Commander-in-Chief of the Army in the Field can of course alone provide for resisting a systematic attack by a large force of the enemy aimed at cutting him off from his base.

An example is given of the force required. It is assumed that the army in the field consists of one army corps (37,000 men), that the base is a seaport, population not actually hostile, length of line 150 miles, and that the marches are 12 miles in length. Force required :

1st. For General Service as required :—1 Regiment of Cavalry, 2 Batteries Field Artillery, 3 Companies Royal Engineers.

2nd. At Base of Operations, on the line of communications and at the Advanced Depot,—1 Battalion of Infantry at each.

Total, 4,790 of all ranks. If more than one corps was in the field it would be necessary to increase the Commissariat, medical and veterinary departments, but the number of troops and combatant staff would be about the same.

Blue Jackets and Marines from the fleet would also be available in case of emergency, and the Inspector-General would besides be able to make use of detachments of convalescents and troops on the march for any temporary purpose. Besides the above, there will be a remount depot of 316 at the base of operations and another of 161 at the advanced depot.

Organization required along Communications by Road.

Halting stations will be established about every 12 miles apart, where arrangements will be made for accommodating horses and men passing through. Some being of more importance than others will be called "first-class stations." Each station will have a staff with a detachment of Infantry, Police, and occasionally Artillery, Engineers, Cavalry, &c. A first-class station will be under a Lieut.-Colonel, a second-class under a Major.

Save in the special case of an attack, when the senior officer present will take command, the Commandant is not to be interfered with by any officer senior to himself who may be passing through the station.

The Commandant of each station will be responsible for the security of the roads and telegraphs within his district, and will make all necessary arrangements for the defence of the station.

It is of great importance to establish good relations with the inhabitants, especially in a hostile district. The Station Commandant is, therefore, directed to try and gain the confidence of the population to induce them to bring in supplies and form markets in the station. He will take care that those who bring in articles for sale are protected and promptly paid.

In case of necessity the Station Commandant, under orders from the Road Commandant, may levy contributions on the district. These may be :

- (1.) Fines on villages for bad conduct.
- (2.) Contributions of cattle, provisions, or stores of any kind.
- (3.) The enforcement of the supply of provisions or other articles on payment of fixed sums.
- (4.) The pressing of transport, such transport being paid for at fixed rates.

From this it will be seen that there is a marked difference between the British system of requisitions and that which prevails in Continental Armies. Every attempt is to be made according to the English system to obtain provisions, etc., by ordinary means, and requisitions are not to be employed till ordinary means have failed, even then, save in cases where contributions are enforced as a penalty for acts of hostility, fair prices are to be paid for all articles requisitioned, at once and in cash. Our principle is to make it the interest of the inhabitants to supply us with whatever we need by prompt settlement and by giving fair prices. In foreign armies the proprietor frequently only receives a sort of bill to be met at the conclusion of the war,—drivers and their carts are taken away for indefinite distances, and sometimes their hire is not paid at all or only after a long delay. We, however, work pressed transport only one stage on the line, and treat the driver well.

Railways.

Railways on the line of communications are invaluable, but as the regulations observe :—"their proper use is so difficult, and so liable to produce confusion, that full and complete instructions are requisite." These instructions are drawn out for the use in time of war of the railways in the United Kingdom, but the same instructions will hold good in other countries.

In the United Kingdom the Railway Inspectors of the Board of Trade are, if necessary, to form a Committee under the Quarter-Master-General for issuing orders and instructions. A "Railway Staff Officer" is to be attached to the Traffic Manager of each railway used by the troops as his Military Assistant.

At each station where troops entrain, detrain, or stop for refreshment, there will be a Station Commandant. The Military Commandants will act under the immediate orders of the Railway Staff Officer.

Close to the rayon of military operations there will be certain stations called "*transfer stations*." Between these stations and the Army all traffic not military must cease.

There will also be certain stations called "*collecting stations*," where the various convoys of stores, men, etc., will be assembled, made into trains, and despatched to their destinations. Permanent stores of provisions and military stores will be formed close to such stations.

In the event of a campaign abroad, a special Director of Railways would be sent out from England to take the place of the Board of Trade Inspector. This Director and the various Railway Station Commandants, &c., will not be interfered with by the Road Commandant, the railway being an independent branch of the communications. The Road Commandant will, however, on requisition, supply troops to protect the line or guard the stations. This officer will also cause the necessary fortifications to be constructed.

The principal duties of a Railway Station Commandant are: general superintendence—regularity and rapidity in loading and unloading trains, and getting men out of the station—specially important to see that Commissariat and store trains are unloaded and cleared out on arrival—trains are not to be delayed on account of irregularities or delays of troops, if troops are late the Regimental Commanding Officer is responsible, if the train, then the Station Commandant. He should leave all traffic details to the railway official and on no account interfere with the general arrangement of trains, as one wrong train may upset the whole arrangements. He must see that water, refreshments, forage, etc., are ready, and to the billeting and camping of troops if necessary. No troops are to be sent along the line of communications without a route.

CHAPTER XIV.

ENCAMPMENTS.

Under this head are included huts, bivouacs, cantonments, as well as ordinary camps formed of tents.

The position and form of a camp must be governed by strategical or tactical reasons,—the selection of a site for a *standing* camp depending principally on its strategical advantages, and that for a marching or flying camp on tactical advantages. Sanitary considerations must, however, also be considered, so that though the selection of the site for a camp is one of the duties of the Quarter-Master General's Department, the Principal Medical Officer should always be consulted.

In the vicinity of an enemy everything must give way to military requirements, but when he is at a distance, say two days' march, the health of the troops must be the chief consideration.

When near the enemy troops should be encamped so that they can be rapidly moved into position for action, the camps of the different units approximating in site to the positions they would occupy in line of battle. The camp should not be along the position itself, but either in front of it when the enemy is at a distance, or in rear of it when he is at hand. The position of a camp should not be commanded nor be liable to be turned,—if it be commanded by a neighbouring height, that height should be occupied so that it may be held by a small force.

Apart from strategical and tactical considerations, the military requirements of a good camping ground are, that it should offer facilities for obtaining abundance of good water, wood, forage, straw and other supplies,—that there should be easy access to the neighbouring roads and that it should have easy internal communications. For this latter consideration the most favourable condition is for the camp to have a good road passing through it from rear to front.

For a camp which is to be used only for one or two nights on a march, the first consideration is rest for the troops, so that although extension is good for sanitary reasons yet it is very trying to men

after a fatiguing march to have to go long distances for their rations, water, etc., and the camp should, therefore, be compressed, and if the country is much cultivated it becomes extremely difficult to find sufficient space for even a Division in extended order.

For the site of a camp, a grass country with a sandy or gravelly subsoil is best, clay is usually damp. There should be good natural drainage and marshes must always be avoided if possible. Forests and extensive woods are liable to produce fever, but for a single night and for bivouacs they would probably be preferred; brushwood is also bad unless on a gravelly or sandy soil. Ravines and water courses must be avoided, as a sudden fall of rain may convert them into streams. The banks of running rivers are good provided the banks are not marshy. Ploughed fields after a few hours' rain turn into regular mud beds. Chalk near the surface is not good unless covered with gravel. Old camps which have been used for any time are as a rule objectionable. Unenclosed lands which have not been broken up are the best and healthiest.

The same conditions apply with regard to the selection of sites whether the camps be of huts, tents or bivouacs.

The form of the camp must always be suited to the ground, and different arms should be encamped on the ground best adapted to them. Cavalry and Artillery on level ground and sheltered places, on account of the horses as they suffer more than men from exposure. Infantry, if necessary, may be encamped on ground with a considerable slope. Good roads should lead from the camps of mounted corps to the water supply, but these should not run through the camp.

PRINCIPLES FOR ENCAMPMENTS :—

1. Free passage through the camp.
2. The tents, huts, etc., should be disposed with a view to the greatest amount of order, cleanliness, ventilation and salubrity.
3. The different regiments and corps must be able to assemble quickly under arms and clear of their tents.
4. The camp must be as compact as possible consistent with the foregoing considerations. Regulations lay down that as a rule the frontage of cavalry, artillery and infantry camps should correspond with the space they cover when deployed into line (allowance being made for intervals between corps);—but with a large force these spaces must be compressed.

Spaces required.—A Battalion of Infantry generally encamps in company columns, officers' tents, kitchens, and regimental transport being in rear. When encamped at full company intervals the frontage required is about 250 yards and depth 166 yards. Sometimes a parade ground 80 yards in depth or less is allowed in front. When ground is restricted the depth may be reduced to 150 or 125 yards.

The front may be compressed by placing the rows of tents at a minimum distance apart of 8 paces from pole to pole,—the frontage will then be reduced to 55 yards.

Between the open and compressed order there are many stages, but as a rule, with a large force such as a Division, a pattern closely resembling the compressed order is adopted.

A Cavalry Regiment is generally encamped in Column of Troops. In open order, at 50 troopers per troop, the frontage is about 230 yards and depth 190 yards. A parade ground 80 yards deep or less is sometimes allowed in front. Close order, 128 yards of front by 130 yards.

The general arrangement is to place the horses of every two troops so that they stand head to head, two rows of tents being between each line of horses. The space required for each line of horses is $6\frac{1}{2}$ yards from heel peg to heel peg, and each horse requires a width of 6 feet. If the frontage is much restricted infantry may be encamped in double companies, and cavalry in squadrons.

A Battery of Artillery in open order has 19 yards between each gun. The front required is 135 yards, depth 138 yards. At close order guns are placed $9\frac{1}{2}$ yards apart with 12 yards on the flanks, or 72 yards of front by 85. A parade ground is sometimes allowed in front.

The arrangement of a battery camp consists of six lines, each line having in front a gun, then its ammunition wagon, and horse lines for them in rear; men's tents on the flanks, officers' tents, etc., in rear.

An Engineer Field Company usually requires 60 yards of front by 90. A Transport Company 40 by 100 yards. Divisional Head Quarters 70 by 70. A small spot for Brigade Head Quarters near each Brigade. A marquee for a Hospital requires 170 yards by 85. For the Transport Department allow the space required by a Field Battery for every 18 wagons.

The intervals between the different units vary according to circumstances, 30 yards is the maximum space usually allowed,—for cavalry this space may be reduced to 25 and for infantry to 15 yards.

In encamping large bodies of troops, a rough sketch of the ground showing the place to be occupied by each corps should be prepared beforehand. In an enemy's country a staff officer cannot of course precede the advanced guard. As soon as the camping ground is selected, orderlies are sent back to show some officer of each unit, sent forward for the purpose, the ground allotted to that unit, the watering arrangements being indicated at the same time. The Brigade is the Infantry unit. Each unit must strictly keep within the limits marked out for it.

Cavalry and Artillery should never be placed on a flank as mounted corps take longer to turn out, unless the Artillery may be necessary for defensive purposes, in which case the guns should be protected by a strong guard of Infantry.

The Engineers usually encamp near the head quarters of the Division. The depots, both for provisions and ammunition, should be placed in a central position, with easy access to all parts of the camp, and close to a good road by which supplies can be brought up, and the Army Service Corps Companies and Transport Columns should encamp near these depots. It is often advantageous to have a special issuing camp very accessible to the troops and separate from the great depots. When a Division is encamped the troops are generally encamped in 2 or 3 lines,—two lines for the combatant forces and the third for auxiliary services. Where the depth is limited, it is better to place the Brigades side by side with a diminished front and greater depth, than to divide the diminished depth into two lines. If possible units of one command should not be broken up. Thus the battalions of a Brigade, or the 3 batteries of the Divisional Artillery, should not be separated, as their being together is better for discipline, supply, and general convenience.

In selecting the site for an encampment the water supply as regards, quantity, quality, distance, and appliances for making it available, have to be carefully considered. Where there are rivers or canals there can be no doubt as to quantity, but where there are only springs or wells the quantity has to be calculated.

A very small stream will, with care, supply a large force,—but its section and velocity should be roughly estimated. Example.—Section of stream 0.25 square feet,—velocity 100 feet a minute. Its supply is 1,500 cubic feet an hour, or at $6\frac{1}{4}$ gallons per cubic foot, 9,375 gallons per hour. Taking an English Division at 10,000 men and 2,500 horses, and allowing 5 gallons per man and 10 per horse, some 70,000 gallons would be required, which this stream would supply in 8 hours,—but it would be necessary to collect it by digging pits, making dams, etc. Wolseley's pocket-book gives several plans for collecting the water supply and for filtering.

Certain sections of a stream are told off to different units for watering, and certain hours allotted when the different units may draw water. Those parts of the stream where horses are watered must be below the parts told off for the troops, and lower down again washing and bathing places. It is most important that the water supply should not be polluted, and sentries should, therefore, be posted over it taken from the first troops that arrive on the ground,—a regular guard being posted when the camp is formed. When the only supply of water is from wells, time must be allowed to draw it, and each well can then only supply about 90 gallons an hour.

Bivouacs.

For campaigning and manœuvres European armies have outgrown the use of tents, which are now only used in standing camps. Troops when possible are cantoned in farms, villages and towns, when these are not sufficient the remainder have to bivouac.

In bivouacking, shelter should always be sought for, improvised shelter places may be constructed with brushwood, straw, branches of trees, blankets, etc.;—frequently, however, in campaigning troops have to bivouac where they stand on the field of battle.

The staff officer merely allots the bivouac ground and leaves all extemporized arrangements to be done regimentally. The spaces required for bivouacking troops are rather greater than when they are under canvas.

A Prussian Battalion and a Cavalry Regiment is allowed 200 paces of front, and a Battery of Artillery 100 paces. An Infantry Battalion for bivouacking is formed in a column of double companies, the two front companies being wheeled outwards form with the rear companies 3 sides of a rectangle in which the arms are piled. Cavalry bivouac in columns of squadrons at half intervals, the front and rear rank horses stand head to head, the men lying down on the flanks and in rear of the horse lines. A Battery of Artillery bivouacs with guns in front line and horses between, wagons in second line with horses between, and men in rear.

Sir Garnet Wolseley says that Cavalry should wheel into open column of squadrons, picket their horses, and each man sleep in front of his own horse. Infantry having wheeled into column should pile arms, and sleep as they then stand in the ranks, the officers in both instances sleeping on the reverse flank. The Artillery having picketed their horses and placed the guns, wagons, etc., as if for a camp, should, like the Cavalry, sleep opposite their horses.

A hut encampment is arranged in much the same way as a permanent canvas camp, with streets and avenues regularly laid out. Huts are either sent out from home arsenals, in which case they are Ordnance Department Stores, or constructed locally by the Engineers.

Cantonments or Billets.

The circumstances under which cantonments are taken up must limit the extent over which troops can be spread. There are two cases to be considered, as when the army is more or less stationary, during a long mobilization, slow preparation for war, suspension of hostilities, in siege operations, etc.,—or when an army is on the march or near the enemy, and only halts for one or two nights. In the first case troops may be spread over a considerable area. This is done with a view to general convenience as better sanitary conditions are obtained and it is less severe on the inhabitants,—while in the second case troops must be kept concentrated.

With regard to the choice between bivouacs or cantonments on the march, the Prussian Regulations lay down some good rules. The choice with them lies between complete exposure, and complete shelter and comfort in houses;—consequently they prescribe that troops must be cantoned to the utmost extent, and they are only to bivouac when they have to be ready for immediate action. The regulations state that even in presence of the enemy and when expecting an attack, troops may be partly bivouacked and partly cantoned in neighbouring villages,—the troops bivouacking nearest to the enemy so as to give those who are cantoned time to assemble. Commanding officers must of course use discretion that the villages are not too far off.

The distance from the outposts materially affects the question. The practice in 1870 of covering the whole front with Cavalry pushed well forward added to the confidence with which troops were placed in cantonments.

In the distribution of cantonments troops are to be arranged as far as possible in the order in which they fight. The mixing up of units is more to be avoided even than in camps, as troops are more likely to be confused turning out into streets, especially at night. It is, however, impossible to prevent mixing up the different arms to some extent on account of utilizing all the stabling available for Cavalry and Artillery.

Neither Artillery nor Cavalry should ever be left alone or isolated if there is any chance of attack, as these services take longer to turn out, so they must be supported by Infantry.

In all cases places of assembly must be appointed for each separate unit. As the advanced guard for the next day's march is detailed before the men lie down, the advanced guard should have a separate point of assembly in case of alarm.

The Division is in all cases the unit of assembly, and when assembled, it awaits further orders before any further concentration is effected.

The street immediately in front of the houses in which the troops are quartered would probably be the point of assembly for a Regiment, whence it would march to the Divisional or perhaps the Brigade place of assembly,—which is always chosen on the side nearest the enemy.

If a force occupies several villages there would be a separate place of assembly in each village where the troops fall in and whence they will then be marched to the general place of assembly.

Places of assembly for Cavalry and Artillery should be outside of and in rear of the village with good roads leading to it.

All Baggage and Transport not required for use should be in rear on the outskirts of the village or town, in order that the wagons

may be quite clear of the cantonment so as not to encumber the roads, but leave them free for the movement of troops. Transport Columns should be near railroads if there are any.

Some good building outside the town should be selected with the advice of the Principal Medical Officer for a Hospital. The head-quarters of each Corps and Division should be well placed and easily accessible. Telegraphic communication between the different head-quarters should be established as soon as possible.

All the roads in the district must be surveyed, and if the cantonments are to be held for any time, they must be kept in repair. Important bridges must be permanently guarded. All plans for rapid concentration should be prepared even if the cantonments be for only one night.

The Staff Officer having made a rough survey of the place in which troops are to be cantoned, allots certain areas to different units, Divisions, Brigades, or in small forces or when time admits, even down to Regiments, taking care to give each unit a distinct line of demarkation. The principal streets and places should be lettered and finger-posts put up directing to Head-quarters, Hospitals, &c. On the corners of streets should be chalked the number of the Regiment in occupation, and on the doors the force in each house.

CALCULATION FOR THE NUMBER OF TROOPS THAT CAN BE CANTONED IN ANY PLACE FOR LENGTHY OCCUPATION.

It is usual to allow one, two, or even three, men per family according to the social conditions of the persons on whom the troops are billeted,—and in these proportions it is considered that troops may be permanently lodged and supplied by the householders. In considering the force which can be billeted on inhabitants in large areas, the number of inhabitants should be known beforehand, and all such information should have been accurately ascertained before the outbreak of war by the Intelligence Department.

Average populations per square mile :—Central Europe, France, Germany, &c., 200, Austria 150, England 400, Belgium 425.

A practical estimate for a lengthy occupation is to allow troops equal in number to half the population in agricultural districts, because the supplies in farms are greater than in towns, and one-third the population in towns and manufacturing districts.

Take an example :—Suppose it is proposed to quarter an Army Corps of 35,000 men in a country where there are 200 inhabitants per square mile,—over what area can it be cantoned? Take the mean between $\frac{1}{2}$ and $\frac{1}{3}$ the population = $\frac{5}{12}$, therefore the Corps would require a space of 400 square miles,—or it could be cantoned in a square area of 20 miles a side. It is always advisable to approximate the area to a square as then the troops can be more easily concentrated. In this case it would take a day and a half to concentrate the Corps.

When large forces such as several Army Corps have to be cantoned they have to be arranged in two or more lines. A certain portion of Light Cavalry would naturally be cantoned in first line to cover the front, and the remainder of the Cavalry as far back as possible to afford them greater protection.

The actual allotment of Divisions, Brigades, &c., to particular towns or villages is done by the Quarter-Master-General's Department in the same way as in camps, certain areas being allotted to each unit and boundaries rigidly defined. This requires some preparation, and the Superior Quarter-Master General must have in his possession all necessary statistics on which to frame his arrangements.

Localities notoriously unhealthy, or affected with disease, must be avoided. It must also be ascertained whether there is sufficient additional water supply over and above what is required by the population. When Prussian troops were in cantonments for any period during the Franco German war, as on the line of communications, they were, as a rule, partly rationed and partly fed by the inhabitants, each case being arranged according to circumstances. It is always politic not to press too heavily on the inhabitants even in an enemy's country.

In all cases where troops have to be quartered for any length of time the co-operation of the civil authorities should be obtained as far as possible.

CALCULATION AS TO THE NUMBER OF TROOPS THAT CAN BE QUARTERED IN A TOWN
OR VILLAGE ON THE MARCH WHERE THE TROOPS CANNOT SPREAD.

Many rules have been given, and the following are good practical ones :

1st. Large buildings, such as factories, churches, halls, hospitals, etc., having large areas and irrespective of their being encumbered with machines, pews, etc. Measure area of whole floor, and allow 1 man to every 3 square yards of space.

2nd. Ordinary houses. The following rule does not apply to each house but to an aggregate of houses in a street. Strike off the whole of one flat for the inhabitants,—then for each of the other stories allow 1 man per yard of front if the house is one room deep,—or 2 men per yard if the house is two rooms deep,—i.e., if it has back rooms; then deduct one-third off the total for unavailable space such as stairs, passages, etc.

For horses, measure the length of barns, outhouses, etc., and allow 5 feet of length for each horse.

The numbers actually put into houses by the Prussians in 1870 during rainy weather was often much in excess of this calculation.

Billets for Artillery and Transport trains must be found in parts where the guns and wagons can be packed without blocking

up the main avenues or streets, and therefore these should generally be placed on the outskirts.

Under these circumstances, where a large number of troops are billeted on inhabitants, it is impossible for the latter to feed them, and the troops must therefore be rationed.

Places for issuing supplies should be in some central spot, or spots, from which streets ramify, so that they may be easily accessible.

For purposes of concentration it is better to billet troops in a few large buildings than to scatter them about in small houses. A large factory, for instance, might hold a whole battalion.

Whenever the enemy is close at hand, and an attack may be expected, or when a sudden advance or retreat may have to be made, every morning one hour before daylight all baggage, etc., of the covering troops may have to be packed and troops turned out under arms as a precautionary measure. In the Spanish Peninsula, when the two armies were watching each other and the Duke of Wellington expected the French troops to advance daily, the British troops covering the main army had every morning for two whole months to pack up all their baggage and stores ready for a start one hour before daylight.

CHAPTER XV.

MARCHES.

Scientific combinations of marches are the means by which strategical plans are carried into effect,—and success or failure is often attributable to the power of marching. To arrange for the march of a large force is a staff duty of the highest importance. An army should always march on as many roads and on as broad a front as possible, provided the various columns are sufficiently near to afford each other mutual support. But the nature of the country, whether close or open, the proximity or distance of the enemy, and the object for which the march is undertaken, are the principal considerations which modify the choice of roads.

The choice of roads has been much influenced by the improvements in modern fire-arms, their increased range, accuracy, and rapidity of fire, enabling troops on the defensive to keep the enemy at a greater distance and to contain them more easily, since the power of local defence has so much increased,—and, consequently, the distances between columns on the march may be increased beyond what would have been considered safe in former days.

In drawing up plans for the general advance of a large force main roads only can be relied upon, as bye-roads are apt to be tortuous, ill-kept, and to become impracticable in rainy weather,—and in close country troops are apt to lose their way. A General may, however, use all the roads in his neighbourhood which have been reconnoitred by his staff and found practicable, provided there is no chance of collision taking place between neighbouring columns even of the smallest kind,—this is most important.

Troops marching by one road should always if possible compose one complete unit. Thus supposing two Divisions can march along two roads, it would be better to have one Division on each than both used by the two Divisions. By having each Division complete on its own road, greater unity of command is obtained, and in forming order of battle each Divisional Commander can form his own supports and reserves having all his force in hand on one road.

RATE OF MARCH.—Calculations for extensive operations cannot be based on the regulation pace for small units, for the rates vary with—the size of the force, the nature of the country whether mountainous or level, the roads whether good or bad, the number of roads that can be used, the distance to be marched whether the march be for many or only for a few days, etc.

In small bodies Infantry can march $2\frac{1}{4}$ miles an hour, Field Artillery $3\frac{1}{2}$, Horse Artillery and Cavalry 5 miles, including occasional short halts of 5 minutes.

The rate of march decreases as numbers increase, and every check is felt in increased effect in long columns. The arm most affected by a check is Infantry because when gaps occur the front has to step short, while mounted corps trot up.

In large bodies, including short halts of 5 minutes, Infantry cannot do more than $2\frac{1}{4}$ to $2\frac{1}{2}$ miles an hour. A Division can march at this rate. If the roads are fair, and with good arrangements, an Army Corps can only do 2 miles an hour, but if the roads are bad, or encumbered, or if there are defiles the rate is much slower.

Fifteen miles would be an ordinary day's march for say a Division which it could complete in 8 hours—six hours' marching at $2\frac{1}{2}$ miles, one hour's halt, and one hour to allow the fighting tail to come up.

In 1866, before the battle of Sadowa, an Austrian Corps took 14 hours to march 12 miles because the roads were both bad and encumbered. At the same battle the Advanced Guard of a Prussian Corps marched 6 miles right across country in $2\frac{1}{2}$ hours, while the main body coming up in rear took 6 hours. Again in the Waterloo campaign, the Prussians from Wavre to Waterloo averaged only $1\frac{1}{2}$ miles an hour, as the roads were all bad. A French column took 7 hours to march 10 miles. These examples are sufficient to show that it is difficult to march at supposed rates under all the circumstances of a campaign.

Ordinary Military Transport can generally march 3 miles an hour, or 20 to 24 miles a day; if empty, they can go at a greater speed and make a longer march; for long marches and lengthy convoys only 2 miles an hour can be calculated upon.

In very long marches, halts for a whole day are generally necessary after from every 4 to 6 days' of marching, to rest the men and enable repairs to clothing, shoes, harness, etc., to be executed, and horse galls attended to.

From history it would appear that single Corps or Divisions can average 12 or 15 miles for marching days, halting on every 5th, 6th, or at most every 7th day. For a few days, 15 to 20 miles a day could be covered,—above 20 miles is considered a forced march and would only be done under exceptional circumstances.

The state of training troops are in regulates the distances considerably. The weight a man carries also tells against him, especially if the roads are bad and hilly. Any weight tells against a man in ascents, and still more so in steep descents, as it drives the foot against the toe of the boot and tends to sore feet. As a rule short marches should be commenced with, and gradually increased as men get hardened. More soldiers are temporarily disabled from sore feet during a campaign than from any other cause, and frequently strong active men are knocked up if long marches are begun at once; training diminishes this evil. Also if long marches are begun at once horses are very liable to sore backs.

The best march on record is that of Napoleon's army from Boulogne to the Rhine in 1805, which was executed at an exceptional rate at the end of August, when the excessive heat of summer was over. The distance is 400 miles and was accomplished in 25 to 26 days. Three Corps marched along 3 separate roads by Divisions at one or two days' interval. The average rate for marching days was 20 miles a day, troops were halted and billeted every 5th day, and, therefore, including halts the rate was 16 miles. The Army arrived on the Rhine in excellent condition and with but few casualties and continued its march on Ulm.

In 1870 Prince Frederick Charles' Army, in marching from Metz to Fontainebleau, averaged 12 miles a day. The 9th Corps was sent on in advance and accomplished this distance in a shorter time as follows:—Metz to Troyes 131 miles in 9 days, and Troyes to Fontainebleau 76 miles in 4 days,—or 19 miles a day.

While the Crown Prince was in pursuit of MacMahon's Army between the 26th and 30th of August, his army accomplished from 15 to 20 miles a day. In this pursuit, owing to the necessity of concentration, large bodies had to march on the same roads, and the troops were consequently frequently on foot for 12 or 16 hours.

General Sir F. Roberts' march in 1880 from Cabul to Candahar to the relief of the latter place deserves notice. His force consisted of 9,900 British and native troops including 1600 Cavalry, and 18 mountain guns with 750 mules. There were in addition some 8,000 camp followers. Medical transport for 1,000 sick was provided and comprised 300 animals and 2,300 dooly bearers. The transport numbered about 2,000 pack animals. The distance to be actually traversed was 318 miles along a single and indifferent road, and the force was dependent on the country for its food supply. The march was completed in 23 days including two halts, or an average of over 15 miles a day, the last two days being very easy marches so as to bring up the troops fresh for action.

The above marches are rather exceptional, as a rule the average rate of advance for prolonged operations may be calculated at 10 miles a day,—*i.e.*, an actual advance of 10 miles along the main

road. Actually troops have to march longer distances as the distances from their encamping ground to the main road, and then from the main road to the encamping ground have to be added. The probability of finding suitable camping grounds must necessarily cause the length of each march to vary from day to day.

In marching it is very important to have frequent short halts of 5 minutes when men can throw off their valises and lie down. Medical authorities state that the action of the heart is very greatly increased in marching, but that it subsides to its normal condition in one minute after the knapsacks are off and the men lie down. Regimental officers are apt not to let their men have this rest, but to make them close up more than necessary and harass them in other ways; this practice should be discouraged. On the other hand loss of distance on the march is a very great evil, evincing want of drill and discipline. A long halt of about one hour in the middle of the march for dining should be allowed at a spot where water is easily obtainable.

The order of march and formation of columns are chiefly tactical questions and are, therefore, not dealt with here, but the nature of the country, and proximity or distance of the enemy will of course modify the arrangement of the different arms.

An Army consists of two parts, combatants and non-combatants; the latter have to provide for the wants of the army but must never get in the way. Near the enemy tactical considerations predominate and the trains must be kept in rear, and the order of march must then be dependent on the order of battle; but when the enemy is at a distance, the ease and comfort of the troops are the first considerations and for this all arrangements that facilitate their rationing should be adopted.

At a distance from the enemy troops may march at intervals which secures a quicker rate and the march is easier to the men, but the question arises what should be the marching unit when at a distance from the enemy? By single regiments is the most comfortable and the quickest method, but they have no Provision Columns, and units become too much broken up. So also marching by Brigades breaks up the organization, and consequently the Division is generally the marching unit. A Division is the most convenient force, it is tactically complete and can fight its own battles,—it is also administratively complete as it can supply itself, having its own trains, reserve ammunition columns, medical establishment, etc. In calculating the length different columns will occupy on a road allowance must be made for lengthening out. In England one-third is generally allowed for lengthening out as a minimum, but it should never reach $\frac{2}{3}$ ds,—if so the discipline of the troops must be bad. As Cavalry and Artillery open out less than Infantry $\frac{1}{3}$ d should be sufficient for a mixed force. Sir Garnet Wolseley allows 5 per cent, but that is too little. The Germans allow 25 per cent. Other inter-

vals, according to circumstances must of course be added,—as when nearing the enemy, an interval of 1, 2 or even 3 miles or more would be left between the combatants and non-combatants.

Length of Column of Route.

A BRITISH DIVISION.

A Battalion of Infantry on a war footing numbers 1,000 rank and file, but 96 of these are band, drivers and pioneers, so that deducting these, and 5 per cent sick, the maximum fighting strength would be about 850 bayonets.

The war establishment of a Regiment of Cavalry is 480 troop horses, deducting horses for the band and a percentage of sick, only 440 sabres can be counted upon.

Taking, then, an infantry battalion as 850, and a regiment of cavalry as 440, and supposing all the trains to be present and that the infantry are marching in fours, and cavalry in sections (front of two) occupying, therefore, double their length of front in line, a British Division (without tents) will occupy 8,330 yards, adding one-third for lengthening out on the march (2,776 yards), it will occupy a road space of 11,106 yards or $6\frac{1}{4}$ miles; practically, however, the whole of the trains would rarely be present.

A British Army Corps will occupy 35,810 yards, adding one-third (11,943 yards),—47,773 yards or 27 miles.

In these calculations the road spaces occupied by guns, wagons, and all vehicles of whatever description are estimated as follows :

12 yards for every 2 horses	} To these distances add 4 yards for every additional pair of horses.
16 “ “ 4 “	
20 “ “ 6 “	

These spaces include 4 yards between each vehicle.

The rule is to march on as wide a front possible, but it is not safe to march infantry in closer column than their length of front in line, because they could not deploy so easily,—also there should be room for orderlies, mounted corps, etc., to pass them. Cavalry and wagons may, however, be packed closer on broad roads.

A rough but good practical rule for calculating the space occupied by troops on the march is to allow :—

1 yard for every two Infantry soldiers.
1 “ for each horseman.
20 “ for every gun.

Add space for trains according to the rules already given, and add one-third to the total distance to allow for lengthening out.

Circumstances must determine what description of wheeled transport must keep up with the fighting portion of a force, and whether that portion of wheeled transport which is required, such as the Regimental Ammunition Carts and Tool Carts, is to keep up

with individual Regiments, or with Brigades, or Divisions. If they follow their Regiments the fighting portion is too much broken up, and the same happens, though in a lesser degree, if they march in rear of Brigades. However, if contact with the enemy is expected they generally follow Brigades, otherwise they are massed in rear by Divisions. If a whole Division were to interpose between Regiments and their S.A.A. and Tool Carts, and a sudden deployment take place, these carts would in the confusion have great difficulty in finding their regiments. All other transport besides the S.A.A. and Tool Carts follow the Division, or sometimes they are placed in rear of a whole Army Corps, but this only in exceptional cases when it is absolutely necessary to keep the fighting portion very much concentrated.

The Staff has no fixed place. The Staff of each unit whether Corps, Divisional or Brigade is generally at the head of its column. That portion of the Mounted Police not employed as orderlies, etc., is usually with the train of the Division.

The train is arranged on the principle that everything should be in the order in which it is likely to be wanted. For instance, when near the enemy the Reserve Ammunition Column or a portion of it would come first,—also a section, or the whole, of the Bearer Company with ambulances. Then would follow the Provision Column and cattle for a day's food and then the baggage. Regimental baggage follows in the order in which the Regiments are marching preceded by the Staff Baggage,—1st, the Divisional Staff Baggage, then the Baggage of the first Brigade preceded by the Brigade Staff Baggage and so on. The bulk of the Field Hospitals would then follow and finally the remainder of the Supply and Military Store trains.

When not in the vicinity of the enemy the above normal formation may be varied,—as for instance the Small Arm Ammunition and Tool Carts follow the Division. Every variation which gives ease to the troops, and enables them to reach their destination more rapidly, and to obtain their necessaries quickly, should be studied. Thus the day's rations, if not carried by the men, their baggage, and camping tools should be at hand,—all other trains being kept well back.

Also when the enemy is at a distance modifications in the order of march may be made for the convenience of the troops. Thus Cavalry might start later than Infantry so as to relieve them of the Infantry rate which is so tiresome and fatiguing to horses. Artillery might start last so that the roads may not be cut up by it before the rest of the troops have passed, and the dust Artillery raises will not then inconvenience them.

The following is the detail of the road spaces already given for British Divisions and Army Corps, marching without tents and ready for battle, the fighting portion being in front and followed at a safe distance by the non-combatant portion :

For a Division.

COMBATANT PORTION.

	<i>Yards.</i>
7 Battalions Infantry (850 bayonets) with ammunition and tool carts only.....	2,870
1 Regiment of Cavalry (440 sabres) with ammunition cart only	492
3 Batteries Field Artillery with ammunition wagons only ..	904
1 Field Company Engineers with its equipment.....	156
$\frac{1}{2}$ Troop Military Police as Orderlies, &c.....	38
$\frac{1}{2}$ Reserve Ammunition Column	428
Medical Department 1st Line, 1 Bearer Company with ambulances, etc., complete.....	480
	5,368
Add $\frac{1}{8}$ for lengthening out	1,789
Total.....	7,157

Or a little more than 4 miles.

NON-COMBATANT PORTION FOLLOWING ACCORDING TO CIRCUMSTANCES.

$\frac{1}{2}$ Reserve Ammunition Column	428
$\frac{1}{2}$ Troop Military Police.....	38
Regimental transport of { 7 Battalions	896
{ 1 Regiment Cavalry.....	144
{ 3 Batteries of Field Artillery	228
2 Field Hospitals.....	368
Commissariat trains.....	860
	2,962
Add $\frac{1}{8}$	987
Total.....	3,949

Or a little more than 2 miles.

Total for the Division $6\frac{1}{4}$ miles.

For an Army Corps.

COMBATANT PORTION.

	<i>Yards.</i>
3 Divisions (at 5,368 yards each).....	16,104
Cavalry Brigade including 1 Battery Horse Artillery.....	1,956
Corps Artillery, 3 Horse and 2 Field Batteries.....	1,440
Corps Engineers, 1 Field Company, 1 Pontoon troop, $\frac{1}{2}$ Telegraph troop	1,012
$\frac{1}{2}$ Troop Military Police.....	38
$\frac{1}{2}$ Bearer Company.....	240
	20,790
Add $\frac{1}{8}$	6,930
Total	27,720

Or $15\frac{3}{4}$ miles.

NON-COMBATANT PORTION.

3 Divisional trains.....	8,886
Cavalry Brigade trains.....	804
Corps Artillery ".....	920
Corps Engineers ".....	184
$\frac{1}{2}$ Troop Military Police.....	38
Medical Department.....	552
Commissariat and Transport Department.....	3,176
Ordnance Store Department.....	480
	15,040
Add $\frac{1}{2}$	5,013
Total.....	20,053

Or $11\frac{1}{2}$ miles.

Total for Army Corps 27 miles.

It is most important that one officer should be responsible for the march of the train and for the execution of orders, etc., concerning the train, so that in the British Service Baggage Masters are appointed who are charged with the command and management of the Baggage and Train.

A Baggage Master, usually a Field Officer, is appointed to each Division,—and one, usually a Captain, to each Brigade. The Divisional Baggage Master is in command of the baggage guard, and is directly responsible to the Assistant Quarter Master General for all the baggage, and receives his orders from him. The Brigade Baggage Masters collect the Baggage of their Brigades acting under instructions from the Divisional Baggage Master.

There are two main limiting conditions to the size of the column which can march on any one road,—one administrative, namely the power to supply the troops with food,—and one tactical, namely the power to concentrate in time for battle. In a country like England where roads are exceptionally numerous it would rarely be necessary to move more than about a Division on one road, but in most other countries at least one whole Corps has generally to march on one road.

The inconveniences are great if a whole Corps starts from one place to march along one road as the tail of the column cannot reach its bivouac till the night is far advanced whatever time in the morning the Corps may have started. There are numerous instances in history of the disastrous effects of ill-planned marches, and the chief disasters arise from troops not being fed at all or not regularly fed. It is very rarely possible to reduce the distance occupied by troops on roads by widening the front, though when feasible it should be done as it saves the wide separation of troops from their supplies. In an open country Cavalry may move across fields, and

Infantry also in the fields on either or on both sides of the road, leaving the latter clear for the Artillery and Train, and thus a force can march closely concentrated.

Napoleon frequently used only one road for very large numbers, he marched as many as 60,000 to 80,000 men along one road, but the difficulties have increased since then owing to the great accumulation of trains of modern armies.

In 1870 the Germans always endeavoured to march one Corps only on one road, and when this was impracticable the second Corps marched a day's distance behind the first. The French did not adopt these precautions and, consequently, their marches were slow and resulted frequently in great confusion.

When a force is broken up among several roads as is the case in peace time, or in a friendly country when the enemy is distant, when each arm may march on a separate road, the following descriptions of roads are best for each arm:—Cavalry the softest and least stony; Artillery the hardest, most level and best; Infantry the shortest.

When large numbers have to march by one road a common practice is to march Corps by Divisions with intervals between the Divisions called sometimes marching in "Echelon." At full intervals the Divisions encamp at the distance apart of the length of their column of route; this is only done when the enemy is at a distance. In an Army Corps, for purposes of marching, the Corps Cavalry and Artillery may be looked upon as a fourth Division, and when marching at full intervals the distance of the hindermost Division is so great as not to permit of its concentrating for battle the same day, consequently when near the enemy reduced intervals must be resorted to.

The advantage of marching with intervals is that on halting the tail of the whole Army Corps has not to be drawn up (27 miles) but only the tail of each Division.

Take as an illustration the march of an English Army Corps which has to be kept concentrated so as to be ready to deploy for battle. Suppose the strength of the battalions and regiments calculated as on page 153 and the combatant portion of each Division to be also of the same strength, that is, suppose the Ammunition and Tool Carts to march with the troops, and the Engineer Company, half the Reserve Ammunition Column, and the 1st line of the Medical train to accompany each Division, with the remainder of the trains in rear of the whole Corps. Also suppose each man and horse to carry a day's rations so that no part of the Provision Column be needed. Then the length occupied by the fighting portion of each Division is just over 4 miles as a maximum, and this limit ought not be exceeded if it is to deploy rapidly.

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Should the Divisions move in Echelon at full intervals the head of each will be 4 miles in rear of the head of the Division in its front. The advantage of this is that all the Divisions can start at the same hour,—but the rear of the fighting part of the 3d Division would be 12 miles in rear of the head of the leading column, which is too far for rapid concentration. It is, therefore, advisable to reduce the intervals; an interval of $2\frac{1}{2}$ miles may be taken as a normal type, and this reduces the extreme distance between the fighting portions of the 3 Divisions to $7\frac{1}{2}$ miles, or half a day's march; and with this interval each Division may commence its march one hour later than the one before it.

Now suppose the Corps troops to be a 4th Division, and A, B, C, and D to be the respective camping grounds of the Divisions $2\frac{1}{2}$ miles apart. Each Division leaves its baggage behind in camp until all the fighting units have passed. If the Division at A starts at 5:30 A.M. its tail will move off at 7:10; therefore, if B starts at 6:30 it cannot reach A till 7:30, so that a margin of 20 minutes will be left between the time the tail of the 1st Division leaves A, and the head of the 2nd Division reaches A, and so for the other Divisions. The tail of D will be clear of A at 1:10 P.M., when the baggage trains of all the divisions may start simultaneously, viz. at 1:10, and as the Baggage train of each Division will not exceed $2\frac{1}{2}$ miles in length, there will be a quarter of a mile between each train.

In some cases of course the Corps troops may have to be split up among the Divisions, as for instance the Corps Artillery may have to march near the front; this would naturally increase the interval of time at which the Divisions could march off.

Mounted orderlies should be posted at the intersection of roads, and in towns at the corners of streets, to prevent the heads of the columns taking a wrong turning and to stop stragglers escaping along them.

Framing Orders for a March.

The Quarter Master General's Department is responsible for the whole arrangements and execution of a march and frames the orders which are published by the Adjutant General's Department. The details orders enter into depend greatly on the system of responsibility in existence. Generally, the Commander-in-Chief issues minutes of instruction or gives verbal directions to his Chief of the Staff and does not enter into details. Napoleon used only to give general instructions to his Chief of the Staff Berthier, but sometimes, especially before a general battle, he entered into what he considered essential particulars and issued detailed orders. His usual plan was to indite a short note to his Corps Commanders comprising information as to the general object of the movement, the state of affairs, the direction of the movement, and information as to what the Corps on the right and left of the Corps Commander addressed, were doing and were ordered to do. This last information is very important as every Corps Commander should know something respecting the movements of the neighbouring Corps.

Wellington's orders were more minute and elaborate, allowing very little latitude to his subordinate Commanders. This is not advisable with large armies, where a close superintendence cannot be maintained, and each Commander on the spot can grasp local circumstances better than the Commander-in-Chief.

The most important principles in framing orders are accuracy, clearness, and brevity.

Superior orders of any kind should not deal unnecessarily with details; the points to which special attention must be given are those in which differences might arise between heads of Departments or Regiments,—and here great clearness is required; but all matters that affect merely the detail of a subordinate command should be left to that Commander to make his own arrangements. To interfere in minor details is not only discourteous but shows distrust, and may even prove deleterious as it hampers the subordinate Commander's arrangements in which he, being on the spot, must be the best judge.

In the British Service there is greater tendency to restrict the unfettered action of subordinates than in many foreign armies in which all subordinates have to act on their own responsibility and discretion in matters that belong to their province, thus strengthening character, inducing self-reliance and a habit of assuming responsibility all so necessary on active service.

Thus in framing orders for a march, if one Division marches independently of all others, *i.e.*, by one road alone, the Divisional Commander should be left alone to arrange his hours of march, etc.; but if other Divisions are on the same road with it, crossing it or joining it, then definite instructions must be given.

If several Divisions, Brigades, or Regiments have to meet at a particular point, the hour at which each is to arrive should be detailed, not the hour of starting which should be left to each individual Commander. If columns have to cross each other the orders should specify the hour at which the column which is to pass first should *clear* that point, but the orders for the second column should specify the hour at which its *head* should arrive.

German orders usually give some information concerning the enemy's movements and positions. This is not usual in the British Service, but it has its advantages, as such knowledge given in cautious terms is more likely to secure the proper carrying out of orders; sometimes, however, it is better to conceal these, as when it is advisable for the enemy not to be informed that his movements are known.

All orders are headed with the authority from which they emanate, as "General Orders," or "Army Corps Orders," the place and date. Paragraphs are numbered and each paragraph should contain what is necessary for one item and no more; separate mat-

ter should not be mixed up in one paragraph. For instance, in orders for the march of an Army Corps the first paragraph would be a sort of preamble, as,—the Army Corps will march to-morrow,—and give the general direction, object of the march, hour and order of march, roads to be followed by different Divisions and detachments. The 2nd paragraph will perhaps contain all that relates to the first Division, the 3rd paragraph all that relates to the second Division, and so on. Then paragraphs dealing with Corps troops, &c., taking them item by item and keeping them separate. The formation of Advanced and Rear Guards, instructions for flanking parties, what are to become of Field Hospitals, Reserve Ammunition Columns, Engineer Forces, Pontoon and Telegraph trains, with details as to what the latter are to do, what telegraph lines to lay, hours when these are to be ready, etc.

Then should come the dispositions of that portion of the train not necessary to follow the fighting portion. Also instructions for provisioning the troops for the day or next 3 days, what rations to be carried by the troops, and whether to be supplied from the trains, magazines, or inhabitants. The orders should also refer to the disposition of the Baggage and other Columns.

One order which is never to be omitted in such orders, is where the General is to be found, or in Army Corps or Divisional orders where the Army Corps or Divisional Commander is to be found; should he move from his place a Staff Officer must be left to open correspondence, and give orders on an emergency. As a rule this is not necessary in Brigade Orders unless the Brigade is much spread out. Then would follow minor details, such as Escorts for the Staff, Baggage trains, also regimental parties required to pitch staff tents etc.,—these are laid down clearly in orders at the commencement of a march and only referred to when necessary.

The orders also publish the Postal arrangements and the means established for communicating with Army Head Quarters, how often regular orderlies are despatched from distant Divisions to Army Head Quarters, so that persons having business correspondence may know when to send them.

During a march orders are given by word of mouth, or better, by written memoranda. Verbal orders are dangerous when they relate to important matters as orderlies are apt to make mistakes. When an order is very important and has to be sent any distance, especially when there is a chance of orderlies being intercepted, duplicate or even triplicate orders should be sent and messengers despatched by different routes.

With reference to what has been said respecting the tendency in the British Service of superiors to interfere in minor details which properly belong to subordinates, it may be remarked that the interference of a Commander with the detail duties of subordinates

should be avoided as much as possible, and he should place confidence in, and allow all reasonable latitude to, the latter. On the other hand, the amount of discretion which can be safely left to subordinates depends on the *proved* ability, energy, attention to duty, experience, and knowledge of the subordinate officer. When officers are only partially trained, or inexperienced, or of doubtful fitness, a commanding officer must necessarily issue more detailed instructions and supervise details more, and he must of course never trust blindly that his subordinates will always carry out instructions in the best manner. He should avoid interference, but he must from personal observation have certain grounds for knowing that his subordinates are performing their duties thoroughly and well, otherwise, when too late to avoid it, a catastrophe may be the first rude awakening to the fact that duties and orders have been always, or have gradually become, neglected, whether from want of knowledge or carelessness. At all times an exact and regular performance of all duties and strict obedience to instructions must be exacted.

CHAPTER XVI.

EMBARKATIONS AND DISEMBARKATIONS.

In the British Navy there are several Transport ships in Commission to carry on all the ordinary transport of troops by sea; in war time, however, these cannot meet the requirements and vessels of the mercantile marine have to be chartered.

The head of the Transport Department of the Admiralty is called the "Director of Transport Services." It is to this Department that all requisitions for the transport of troops are addressed by the Quarter Master General's Department. At foreign stations the local representative of the Quarter Master General's Department applies to the local representative of the Admiralty, generally the senior naval officer, who has to decide whether the service is to be performed by one of Her Majesty's Transports, or by hire, chartering, or freight. When there is no naval officer the agent for hiring transports is the Commissariat officer.

Three distinctive terms are applied to hired vessels:

1. *Transport*,—a ship wholly engaged for Her Majesty's service by the month or by the trip.
2. *Troopfreight ship*,—one not wholly engaged but in which conveyance for troops can be secured.
3. *Storefreight ship*,—one either wholly or partially employed for carrying stores.

The first operation in hiring shipping is to call for tenders, stating the general object for hiring, and by what time vessels are to be ready. In cases of small hirings tenders are sufficient, for larger hirings a "charter party" is necessary which is a legal document binding each side. Certain clauses always bind the master of the ship to comply with the orders of naval agents and with the Regulations, and in case of disobedience of orders, or breach of agreement, he is to be mulcted. Clauses are also inserted securing the ship's boats and crew for embarking and disembarking. When vessels are hired by the trip the master of the ship stipulates for demurrage (usually at the rate of 20 shillings a ton per month for steamers)

if kept waiting longer than a specified time at any port. For embarking or disembarking troops or stores the time allowed is generally from 6 to 10 days, and 4 days for calling at intermediate ports.

Paddle steamers are preferable for Cavalry as they do not roll so much, and vessels for Cavalry should never have less than 30 feet of beam.

Large ships are in all cases preferable to small ones,—they are more economical, comfortable, and healthy. The minimum height between decks for Infantry should be 6 feet and for Cavalry 7 feet.

The capacity of a ship is estimated by its tonnage; the usual estimate is about $2\frac{1}{2}$ tons per man, and from 8 to 10 tons per horse. These rates include all requisite accommodation for equipment, baggage, food, forage, etc. If the meat supplied is salt beef, and biscuits are in bags, 10,000 rations occupy 950 cubic feet; if the meat is salt pork and biscuits are in barrels, 10,000 rations occupy 1,350 cubic feet. A cabin for one officer is estimated at 30 superficial feet and 195 cubic feet.

To ascertain accurately the number of men a ship will accommodate it is necessary to measure the clear space between decks and then calculate the number of hammocks it will hold. Formulæ have been given but these are not of much use as the spaces are much cut up with masts and gear of all kinds. For slinging hammocks the height between decks should be 6 feet at least. A hammock is 9 feet long but the ends interlace $1\frac{1}{2}$ feet, the breadth allowed is 16 inches, so that 6 feet $\times$ 16 inches is the space required for each hammock,—except for those at the end of each row where $1\frac{1}{2}$ feet are lost.

Before calculating the space for men, all spaces required for extra cabins, baggage rooms, etc., must first be deducted. These requirements are:—extra officers' cabins; hospital room in the proportion of 3 per cent to the men embarked, with Dispensary attached; baggage room; helmet room; magazine; room for stowing hammocks; stowage room for provisions; latrines for 3 per cent, etc. There must also be mess table accommodation, and places to stow away valises and kit bags near the tables, also a well protected spot for stowing arms easily got at by the troops.

Two Boards of Survey generally assemble to inspect each ship that is to be hired; the first has to decide whether the ship is suitable for the purpose; and if taken up, the second board is convened to see that all the necessary fittings, etc., are complete. These boards are generally mixed boards of naval and military officers.

The operation of embarking men, after the heavy baggage is on board, is a very simple operation if the ship is alongside a wharf, but if the vessel is 200 or 300 yards from the shore boats have to be used and the operation takes time. If accommodation ladders are provided, the slings of rifles are removed as rifles are stowed with-

out slings, but if the men have to climb the sides of the ship the slings are only loosened, and the men then move into the boats in single rank and at once sit down. Launches in use in the British Navy hold 60 men, and it is calculated that a Regiment could be embarked on board the ship in about one hour without heavy Baggage and trains, or in six hours with its transport complete.

When large forces have to be embarked, the orders for embarkation must provide for every detail. It is desirable to have as many embarking places as possible distinctly marked off for the different regiments and corps by boards, signposts, etc.; intervals being left between them to prevent mixing of troops.

The Transports are usually told off into Squadrons corresponding with Divisions and Brigades, each squadron being under a naval officer, and each transport has a distinguishing number.

The orders for embarkation should contain the exact time and place for every detachment to parade,—the number of Transport told off to it, and all details as to rationing, dress, baggage, ammunition, etc.

It is important to keep each unit embarked on board a transport complete in itself with its regimental transport, etc., so that when disembarked it may be ready to fight or march off.

FITTING HORSE TRANSPORTS.—For horses, stalls are fixed up side by side, horses' heads looking inwards. Accommodation required:—length across ship for each horse 8 feet $1\frac{1}{2}$ inch; breadth of stall, 2 feet 5 in; height of deck, 7 feet. The minimum breadth of beam between decks for two rows of horses, allowing 3 feet of gangway between them, is 23 feet 3 inches. Horses cannot lie down but are rested by using horse hammocks, by means of which they are triced up to take their weight off their legs. Spare stalls at the rate of 10 per cent are to be left to allow of stalls being cleaned. Horses should stand upon moveable platforms so that the decks may be thoroughly cleaned. Great attention must be paid to the ventilation, and ventilating shafts must be constructed.

The allowance of forage on board ship is, oats 5 lbs., hay 10 lbs., bran 5 lbs., water 8 gallons.

A forage room and a forage issuing room are required; also Veterinary Surgeon's dispensary; and spare stalls and horse boxes on deck for sick horses. The accommodation for the men must be completely distinct and separate.

METHOD OF EMBARKING HORSES.—The most common way is by slinging up from the wharf by tackle at the yard arm, and lowering them directly through the hatchway, which is roughly padded, to the horse deck. Minimum size of hatchway is 10 feet by 10 feet. With one tackling about 20 to 25 horses can be slung in one hour.

Sometimes horses can be walked on board, but then as a rule they have to be slung, which is no gain unless several ships are alongside and they are walked from one to the other.

When horses are taken off in lighters the soldier himself stands by his own horse, his saddle and accoutrements going with him.

Horses sometimes have to be embarked by swimming. In this operation the sling is put on first and fastened on the back ready for the ship's tackle to be hooked on. A small boat with two men accompany each horse. One man rows, the other tows the horse by means of a rope fastened to his neck, and another rope is fastened to the lower ring of the headstall by means of which he keeps the horse's head above water. Before embarking horses their saddlery or harness must be taken off and packed in vats or sacks.

DISSEMBARKATION is merely the reverse of embarkation. The orders for disembarkation must be minute in detail, stating the manner in which it is to be carried out, hours the several corps are to leave the ships, in what order, by what means, etc., what clothing to be worn, what rations to carry, ammunition, stores, etc. All corps, when landed, must be immediately marched off clear of the beach to leave it clear for those following. Brigades and Divisions should be landed without being mixed up, and each Division with its guns, horses, etc., should be complete on shore before another commences to leave the ships.

A disembarkation in the presence of an enemy is a difficult operation. If the troops have been on board ship any time, they and the horses should be landed a few days' steam from the place of disembarkation to organize. A proper supply of boats, to hold about 40 or 60 men, for disembarking the troops must be provided, also ratts, flats, pontoon rafts, horse boats, etc. Boats should be towed by steam launches and gunboats. The arrangements should allow of a complete unit, say one Division, being put on shore in one trip. The transports carrying each Division should anchor in lines in the order in which they are to land. One Division being landed, the boats will return for the next. The men must get into the boats in the order in which they are to stand in line, sit down and not load their rifles till landed. Regimental transport, etc., must not be landed until a force sufficient to protect it is on shore, a party being left on board to land it.

The first Division landed will cover the landing of the remainder, and must, therefore, seek to take up a strong position aided by fire from the fleet which will of course cover the disembarkation.

The selection of the spot for landing is an important consideration, and depends much upon topographical considerations, the decision being made conjointly by the Naval and Military Commanders.

In these days of torpedoes,—harbours, roadsteads with narrow entrances, and mouths of rivers must not be selected. The general desiderata of a good landing place are :

1. A good practicable beach of sufficient length for landing a sufficient force at once.
2. Good anchorage for men-of-war close to shore to cover the landing with the ship guns, and anchorage for transports not too far off.
3. Ground near the beach should not give ready made positions such as high ground overlooking the beach for the opposing force, but should afford a suitable position for the first troops landed to cover the disembarkation of the remainder.

Promontories are advantageous in that the ship's guns can protect the flanks, but they are exposed and the enemy might fortify the neck. Bays deep enough to give shelter from winds, sufficiently large for all vessels, and so wide as to render a converging fire of the enemy impossible are the best.

Other considerations of importance are :—the nature of roads, whether they lead on the objective, water supply, and other supplies available, and whether any land transport be obtainable as sufficient can rarely be conveyed.





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